NEW LOOK

Personal Computer World

TeAM YYePG
Digitally signed by TeAM YYePG
DN: cn=TeAM YYePG, c=US, o=TeAM YYePG, ou=TeAM YYePG, email=yyepg@msn.com
Reason: I attest to the accuracy and integrity of this document
Date: 2005.09.22 20:56:45 +08'00'

TECHNOLOGY, TESTED! www.pcw.co.uk

PHOTO PAPER: THE TRUTH!

BIGGEST EVER 17 ON TEST

ALL BRANDS ARE NOT EQUAL

What's best for your printer and why!

ANTI-SPYWARE SOFTWARE

Know who's watching you...and how to stop them

PLUS

- Rock Hardbook
- Sony HDR-HC1E camcorder
- Pentax Optio S5z
- Elonex Mediastar 1541
- Creative X-Fi soundcard
- Dell Laser Printer 1100
- Orange SPV C550

- Mio 269 Sat Nav
- Maxtor Onetouch II
- Sony HDR-HC1E

IF YOUR COVER DISC IS MISSING PLEASE ASK YOUR NEWSAGENT

ALL NEW!

- Over 215 products tested
- All new Buyer's Guide
- 38 pages of expert advice
- UK's leading labs

WINDOWS VISTA

What's new in Microsoft's next OS

DUAL-CORE PCs

THE BEST 7 ON TEST

How they improve your computing

PROTECT YOUR HOME

Network webcams

GROUP TEST

THE FUTURE OF VIRTUAL PCs

Why next-gen CPUs boost productivity

HOW TO

- Connect remote networks
- Emulate photo filters
- Make your PC quieter
- Use Linux shell scripts
- Get more from RSS

9 770142 023106 11 >
£3.75
OVERSEAS PRICE £3.95
vnu business publications
NOVEMBER 2005

Dell™

Offer ends Wednesday 21st September 2005

Power up your Business

with free double memory on selected systems

Dell™ recommends Microsoft® Windows® XP Professional

Quality, value and free double memory

With Dell you get reliable technology that helps keep your business running, at a price that suits your budget. And right now, you'll get even more value for your money with free double memory.

You won't find the world's number one PC company* in stores, so call or go online directly to Dell today!

*IDC 2005 Q2 Vendor Ranking

ACCESSORIES[2]

Dell™ Axim™ X50v Wireless/ Bluetooth® 624MHz

Featuring a super fast 624MHz Intel® XScale® Processor, 3.7" VGA display and an advanced 3D graphics card, integrated Wireless LAN and Bluetooth® . CompactFlash and SDIO expansion slots.

£259 Excl. VAT. **£304** Incl. VAT.

Dell 3400MP Micro-Portable Projector

Small enough to fit in your hand and weighing only 1.09Kg, the 3400MP features 1500 lumens[3] brightness, 2100:1 contrast ratio and native XGA resolution.

10% Off

~~£899~~ **£809** Excl. VAT. ~~£1056~~ **£951** Incl. VAT.

Dell™ Dimension™ 5100

- Intel® Pentium® 4 Processor 531 with HT Technology (3GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512MB DDR RAM (Was 256MB)
- 250GB Serial ATA Hard Drive (7200 RPM)
- 17" Analogue Flat Panel Monitor (17.0" v.i.s)
- Integrated Intel® Pro 10/100 NIC
- Integrated Intel® Extreme Graphics
- 16x DVD+/-RW Drive[1]
- 1 Year Collect and Return (CAR) service

£479 Excl. Del. and VAT **£620** Incl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-D09512

Further enhancements

Standard Service Package	£188 incl. VAT
Microsoft® Office 2003 Basic Edition[2]	£106 incl. VAT
Dell Photo Printer 540[2]	£99 incl. VAT

Dell™ Inspiron™ 6000

- **Intel® Centrino™ Mobile Technology** with Intel® Pentium® M Processor 725 (1.60GHz, 2MB L2 Cache, 400MHz FSB) & Intel® Pro/Wireless 2200 (802.11b/g)
- **Microsoft® Windows® XP Home Edition**
- 768MB 400MHz DDR SDRAM (Was 512MB)
- 60GB Hard Drive
- 15.4" Wide Aspect UltraSharp™ WXGA (1280X800) Screen
- Intel® GMA 900 shared graphics memory up to 128MB
- Internal 8X DVD+/-RW Drive[1]
- 56K Data Fax Modem
- 1 Year Euro Collect and Return Service[4]
- Microsoft® Works 7.0

£579 Excl. Del. and VAT **£738** Incl. Del. and VAT

FREE MEMORY UPGRADE

E-VALUE Code: PPUK4-N09602

Further enhancements

Standard Service Package	£329 incl. VAT
Microsoft® Office 2003 Basic[2]	£129 incl. VAT
Nylon Carry Case[2]	£35 incl. VAT

0% Finance Available* (Subject to Status)

Go online for the latest deals Click **www.dell.co.uk/business**

Business PCs 0870 907 5301 Home PCs **0870 907 5398**

Order online or on the phone. Easy as

DELL

Dell™

Free Double Memory on selected systems

Dell Dimension™ 3000

- Intel® Celeron® D Processor 320 (2.40GHz, 256K Cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB DDR RAM
- 80GB Hard Drive (7200 RPM)
- Integrated 10/100 NIC
- Integrated Intel® Extreme Graphics
- 16x DVD-ROM
- 90 Day Collect and Return (CAR) Service[5]
- Microsoft® Works 7.0

£199 Excl. Del. and VAT **£291** Incl. Del. and VAT

AMAZING VALUE

E-VALUE Code: PPUK4-D09301

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- Microsoft® Office 2003 Small Business Edition[2] £212 incl. VAT
- Kensington® Slim Microsaver Lock[2] £25 incl. VAT

Dell Dimension 3000

- Intel® Celeron® D Processor 330 (2.66GHz, 256KB Cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512MB DDR RAM (Was 256MB)
- 80GB Hard Drive (7200 RPM)
- 17" Flat Panel Monitor
- Integrated 10/100 NIC
- Integrated Intel® Extreme Graphics
- 48x CD-RW/DVD Combo Drive
- 90 Day Collect and Return (CAR) Service[5]
- Microsoft® Works 7.0

£329 Excl. Del. and VAT **£444** Incl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-D09302

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- Microsoft® Office 2003 Small Business[2] £212 incl. VAT
- APC Surge Arrest[2] £12 incl. VAT

Dell Dimension 9100

- Intel® Pentium® 4 Processor 640 with HT Technology (3.20GHz, 2MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 1024MB DDR RAM (Was 512MB)
- 320GB (SATA) Stripe Raid 0 Hard Drive
- 19" Flat Panel Monitor
- Integrated Intel® Pro 10/100 NIC
- 128MB PCI-Express ATi® Radeon™ X300SE
- 16x DVD+/-RW Drive[1]
- 1 Year Collect and Return (CAR) service
- Microsoft® Works 7.0

£699 Excl. Del. and VAT **£879** Incl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-D09912

Further enhancements

- Standard Service Package £188 incl. VAT
- Microsoft® Office 2003 Small Business Edition[2] £212 incl. VAT
- Avermedia TV Tuner Plus[2] £70 incl. VAT

ACCESSORIES[2]

Dell Photo All-in-One Printer 942

Enjoy printing, scanning, PC-based faxing and photocopying. The 942 also offers advanced photo features. Fast printing, high quality prints combined with memory card slots, LCD panel, and borderless printing.

20% Off

~~£84~~ **£67** Excl. VAT. ~~£99~~ **£79** Incl. VAT.

Dell UltraSharp™ 2405FPW

The Dell UltraSharp 2405FPW's higher width-to-height ratio makes it easer to run multiple applications on the screen side-by-side.

FROM **£719** Excl. VAT. **£845** Incl. VAT.

Buy 1 Colour Laser Printer and save 30% on 2nd of same type.

Dell 26" LCD TV

Enjoy fantastic picture and sound quality from Dell's new 26" widescreen flat LCD TV. Bright, crisp images and powerful stereo sound combine to give a great viewing experience.

25% Off

~~£907~~ **£680** Excl. VAT. ~~£1066~~ **£799** Incl VAT.

Dell Laser Printer 1700/1700n

The Dell Laser Printer 1700 offers brilliant quality and affordable monochrome printing in a compact design. With fast printing speeds of up to 25 pages per minute.

FROM **£115** Excl. VAT. **£136** Incl. VAT.

Dell 19" LCD TV

The Dell W1900 LCD TV provides a terrific TV viewing experience. With 1280 x 768 resolution, it is optimised for DVD, today's standard TV signals, and tomorrow's High Definition broadcast standards.

25% Off

~~£521~~ **£391** Excl. VAT. ~~£612~~ **£460** Incl. VAT.

0% Finance Available* (Subject to Status)

12 monthly payments and on month 13 choose to settle your account in full for the cash price, or continue with your monthly payments for a further 24 months making it a 36 month lease in total.

Offer ends Wednesday 21st September 2005

Call or go online today

Dell™ recommends Microsoft® Windows® XP Professional

Dell Inspiron™ 6000

- Intel® Celeron® M Processor 360 (1.40GHz, 1MB L2 Cache, 400MHz FSB) & Intel® Pro WLAN 2200 802..11b/g
- Microsoft® Windows® XP Home Edition
- 512MB 400MHz DDR SDRAM (Was 256MB)
- 40GB Hard Drive
- 15.4" Wide Aspect UltraSharp™ WXGA (1280X800) Screen
- Intel® GMA 900 shared graphics memory up to 128MB
- Integrated 8x DVD-ROM/ 24x CDRW Combo Drive
- 56K Data Fax Modem
- 1 Year Euro Collect and Return Service[4]
- Microsoft® Works 7.0

£439 Excl. Del. and VAT **£573** Incl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-N09601

Further enhancements

Standard Service Package	£329 incl. VAT
Microsoft® Office 2003 Basic[2]	£129 incl. VAT
Dell Deluxe Nylon Carry Case[2]	£35 incl. VAT

Dell Inspiron 9300

- **Intel® Centrino™ Mobile Technology** with Intel® Pentium® M Processor 740 (1.73GHz, 2MB L2 Cache, 533MHz FSB) & Intel® Pro Wireless 2200 (802.11b/g)
- **Microsoft® Windows® XP Home Edition**
- 512MB 533MHz DDR SDRAM (Was 256MB)
- 40GB Hard Drive
- 17.0" UltraSharp™ Wide Screen XGA (1440x900) TFT Sharp
- 64MB ATi® Mobility™ Radeon™ X300 Graphics card
- Integrated 8x DVD-ROM/24x CDRW Combo Drive
- 56K Data Fax Modem
- 1 Year Euro Collect and Return Service[4]
- Microsoft® Works 7.0

£679 Excl. Del. and VAT **£855** Incl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-N09931

Further enhancements

Standard Service Package	£329 incl. VAT
Microsoft® Office 2003 Small Business[2]	£235 incl. VAT
Dell Leather Carry Case[2]	£47 incl. VAT

Dell Inspiron 2200

- Intel® Celeron® M Processor 360 (1.40GHz, 1MB L2 Cache, 400MHz FSB) & Dell Wireless 1370 Mini PCI Card
- Microsoft® Windows® XP Home Edition
- 256MB 266MHz DDR SDRAM
- 40GB Hard Drive
- 15" XGA TFT (1024x768) Screen
- Integrated Direct AGP Graphics
- Integrated 8x DVD-ROM/24x CDRW Combo Drive
- 56K Data Fax Modem
- 90 Day Collect and Return Service[5]
- Microsoft® Works 7.0

£329 Excl. Del. and VAT **£444** Incl. Del. and VAT

E-VALUE Code: PPUK4-N09221

Further enhancements

3 Year Basic Services Package	£94 incl. VAT
Microsoft® Office 2003 Basic[2]	£129 incl. VAT
Logitech Quick Cam Zoom[2]	£35 incl. VAT

Dell PC Services

Basic Service Package
Designed to fix problems quickly & protect your system with 1 or 3 Year Next Business Day onsite service plus the added benefit of Online training for 30 days to help you learn how to maximise the multimedia potential of your PC.
Prices from **£80.00** ex VAT.

Standard Service Package
As Basic 3 Year Package PLUS Anti-Virus software to help you protect your data, online training for 30 days to show you how to protect your system from unwanted online intruders & viruses PLUS accidental damage cover to protect your system from most knocks, spills and power surges.
Prices from **£140.00** ex VAT.

Premium Service Package
As Standard Package but with the addition of Online Microsoft® Office training for 30 days to help you maximise the benefit of your PC investment.
Prices from **£230.00** ex VAT

Please ask our Sales Team to advise you.

For full details go online at www.dell.co.uk/services

Servers

Dell PowerEdge™ SC430 SATA

- Intel® Celeron® Processor 2.53GHz Single Processor Only
- 512MB ECC DDR2 SDRAM
- 80GB 7200rpm SATA hard drive
- Optional Adaptec U320 SCSI controller
- Embedded Gigabit NIC
- 1 Year Next Business Day Service
- Microsoft® Windows® Small Business Server 2003 (Standard)

£499 Excl. Del. and VAT

INCLUDES MICROSOFT® SMALL BUSINESS SERVER

E-VALUE Code: PPUK4-SC94305

Dell Products. c/o PO Box 69, Milbanke House, Western Road, Bracknell, Berkshire, RG12 1RD. Terms and Conditions of Sales, Service and Finance apply and are available at www.dell.co.uk or on request. UK Business customers only. Subject to availability, prices and specifications are correct at date of publication and may change without notice. One GB = 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less. Dell™ Dimension desktops and Inspiron notebooks include Microsoft Works 7.0 as standard unless otherwise specified. Promotional Offers apply to a maximum order size of 5 systems. Delivery charge is £49 Ex VAT (£57.58 incl. VAT) per system. [1]Discs burned with DVD+/-RW and DVD+RW drives, where featured, may not be compatible with certain existing drives. [2]Delivery charge ranges from £3 Excl. VAT (£3.53 Incl. VAT) to £13 Excl. VAT (£15.28 Incl. VAT) per item depending on order size when purchased without a system. [3]Based on ANSI/NAPM IT7 .228-1997 tests (using new bulbs) of between 34-305 units in 2002-4 (dependent on model). Average Lumens at least 90% of max Lumens. Bulb brightness degrades with use - periodic changes recommended. [4]Euro Collect and Return Service is available in limited countries and places. [5]Dell service offerings do not affect customer's statutory rights.

©2005 Dell Inc. Dell, the Dell logo, Dimension, Inspiron, Axim, PowerEdge, PowerConnect, Dell Toner Management and UltraSharp are registered trademarks or trademarks of Dell Inc. Dell disclaims proprietary interest in the trademarks or trade names of other entities used to refer to them or their products. Microsoft, MS and Windows are registered trademarks of Microsoft Corporation. Intel, the Intel logo, Intel Inside, the Intel Inside logo, Pentium, Intel Xeon, Celeron, Intel Centrino and Intel XScale are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

*0% Finance is available from Dell Financial Services (CIT Group (UK) Limited). Credit is available only to UK body corporate and subject to status. All amounts exclude delivery and VAT. Prices shown may vary without notice. Terms and conditions and written quotations are available on request. Credit scoring used. Those not qualifying for 0% may qualify for other finance offers.

Dell Enterprise Products & Services

Dell™ offers assistance during every stage of your solution's lifetime

- from helping you decide which system and level of support best suits your business, to planning, installation, training and on-site support & service.

Furthermore, by giving you a single point of contact, we save you time and simplify your supply management.

Bronze level of support during business hours and next business day on-site service after telephone based diagnosis, ideal for non-critical systems.

Silver Support 24x7 for telephone troubleshooting, including software assistance. Silver customers benefit from the Enterprise Service Force (ESF), specially trained field-technicians.

Gold In addition to Silver, Gold customers benefit from Dell's most senior 2nd level support engineers. A Technical Account Manager is also available for Gold customers to ensure the highest possible service.

Dell™ recommends Microsoft® Windows® 2003 Server Edition

Servers

Dell™ PowerEdge™ 1800 Improved Server Performance

- 64-bit Intel® Xeon™ processor 2.80GHz Dual Processor Support with 800MHz FSB
- 512MB ECC DDR-2 SDRAM (400MHz) SDRAM Memory (was 256 MB), max. 12GB
- 80GB 7200rpm SATA hard drive
- Single Embedded U320 SCSI Controller
- Single embedded Gigabit NIC
- 3 Year Bronze Next Business Day Support

£599 Excl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4- PE918001

Further enhancements

- Add a second Intel® Xeon® Processor 2.80GHz £270 excl. VAT
- Add 512MB memory & Microsoft® SBS 2003 Standard £385 excl. VAT

Dell™ PowerEdge™ SC1420 SATA

- 64-bit Intel® Xeon™ processor 2.80GHz
- Dual Processor Support with 800MHz FSB
- 512MB DDR SDRAM Memory (for the price of 256MB)
- 80GB 7200rpm SATA hard drive
- Optional CERC SATA RAID Controller
- Embedded Gigabit NIC
- 1 Year Next Business Day Service

£399 Excl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-SC914201

Further enhancements

- 1GB DDR2 400MHz memory £110 excl. VAT
- Add 2nd 64-bit Intel® Xeon™ processor 2.80GHz £250 excl. VAT
- 3 Year Bronze Next Business Day Support £170 excl. VAT

Dell™ PowerEdge™ SC1425 SATA

- 64-bit Intel® Xeon™ processor 2.80GHz Dual Processor Capable
- 512MB DDR SDRAM Memory (for the price of 256MB)
- 80GB 7200rpm SATA hard drive
- Optional Software RAID for higher data availability
- Dual Embedded Gigabit NIC
- 1 Year Next Business Day Service

£399 Excl. Del. and VAT

FREE DOUBLE MEMORY

E-VALUE Code: PPUK4-SC914251

Further enhancements

- 1GB DDR2 400MHz memory £110 excl. VAT
- Upgrade to a 250GB SATA HDD £128 excl. VAT
- 3 Year Bronze Next Business Day Support £140 excl. VAT

Go online for the latest deals Click **www.dell.co.uk/business**

Business PCs 0870 907 5301 Home PCs **0870 907 5398**

Order online or on the phone. Easy as

SERVERFREAK
HOSTING SOLUTIONS

Webhosting
ServerFreak Webhosting Solutions simply offers the most affordable hosting available anywhere! With features such as CPanel, CGI/Perl, Fantastico, MySQL, PHP, 24/7 customer service - Why go anywhere else?

Risk-Free Trial
We also offer an UNCONDITIONAL 30 DAY MONEY BACK GUARANTEE! You can try us out RISK-FREE. Whether you are building a personal website or a professional website for your business, you will find what you need at ServerFreak Webhosting Solution.

Guranteed 99% Uptime
Our state-of-the-art data centers are comprised of ultra high-quality connectivity, networking gear, climate control, security and power systems. Our facilities are monitored 24/7/365 from our state-of-the-art network operations center.

Technical Support
ServerFreak prioritizes customer support to ensure customer satisfaction. With over 7 years of experience in e-commerce, we are ready to provide professional support based on our extensive knowledge in this field. Our highly skilled team will configure, monitor and manage your hosting account 24/7 and be there whenever any problem arises.

FOR MORE DETAILS VISIT
WWW.SERVERFREAK.BIZ

SERVER SPECIFICATIONS

Quad Xeon Pentium (r) 2.6 Ghz
2048 Mb SDRAM
600 Gb HDD (RAID 1)
RedHat Enterprise Linux WS4

BEGINNER PACKAGE
FOR ONLY $9.95 PER MONTH

Diskspace	2000 MB
Bandwidth	25 GB / month
Control Panel	CPanel w/ Fantastico Pro
POP3 Mailboxes	Unlimited
MySQL	Unlimited

DOMAIN REGISTRATION
FOR ONLY $9.95 PER YEAR

Available domain extensions:

.com .net .org .info .biz

COPYRIGHT 2004-2005 SERVERFREAK HOSTING SOLUTIONS.
ALL RIGHTS RESERVED.

Personal Computer World
November 2005

Contents

99 PHOTO PAPER: THE TRUTH
BIGGEST EVER 17 ON TEST
Find out which brand is best

94 PROTECT YOUR HOME
Network webcams put to the test

REGULARS

9 Editorial
188 Reader offers
192 Competitions
194 Contact us & *PCW* on the web
195 In the next issue
196 Flashback

INTERACTIVE

30 Letters
32 The Adviser
35 Gordon Laing – Inside information
36 Guy Kewney – Kewney @ large
37 Barry Fox – Straight talking

NEWS

14 Intel drive to cut power use
New deals on ultra-fast access
15 Air-safety check on mains data
16 Hackers 'build open MacPC'
17 Back-to-school notebooks
18 Google late into web calls
20 Mobile TV gets on the road
22 Intel Developer Forum round-up
25 Office moves could affect world
28 *PCW* Awards for Excellence

28 Cast your vote in this year's PCW Awards and win one of our great prizes

REVIEWS

41 Will Stapley highlights some of the products to look out for this month, and we explain our scoring and awards system

Hardware

42 Elonex Mediastar 1541
43 Mesh Matrix Xtreme PCW
46 Dell Optiplex GX620
Rock Hardbook

Peripherals

47 Sony HDR-HC1E
Pentax Optio S5z
48 Creative Soundblaster X-Fi Elite Pro
Orange SPV C550
49 Dell Laser Printer 1100
50 Cellink BTST-9000D
Mio 269
51 Logitech Cordless Desktop S 510
Media Remote
54 APC Wireless Router
Maxtor Onetouch II Firewire 800
Hercules Wireless Router
NEC ND-3540A

Components

58 MSI 945P Platinum
Storcase Data Express
59 Enermax CS-718 Maxflow
Foxconn 915PL7AE-8EKRS
FSP Zen 300W
PNY Geforce 7800GTX

Software

60 Macromedia Studio 8
61 Zone Labs Zone Alarm Internet Security 6.0
63 Filemaker Pro 8
64 Mythicsoft Remote Command
Webex MywebexPC
65 Google Talk (Beta); Miracle Type; Undelete 5; Ufly4less

Games

68 Chrome Specforce
69 Big Mutha Truckers 2
ER

Group tests

71 **Dual-core PCs**
More speed and greater performance are the boasts of these systems – find out if they match up

85 **Anti-spyware software**
Packages to help maintain your privacy

94 **Network cameras**
Monitor your home when you're away

99 **Photo paper: the truth**
Are own-brand papers worth the cost?

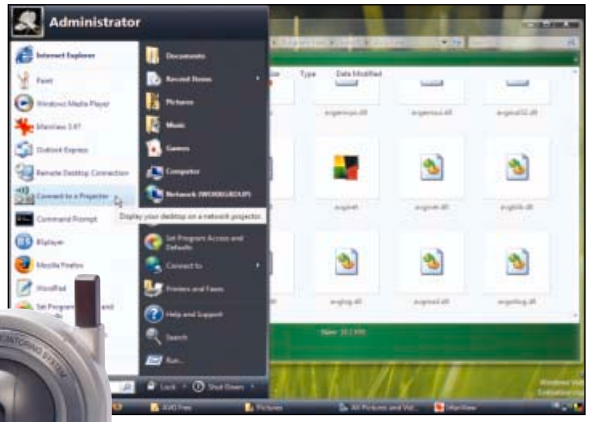
107 **Power over Ethernet**
Set up a network without untidy cables

111 **How we test**

→ For daily news updates, reviews and downloads www.pcw.co.uk

71 DUAL-CORE PCS

How they can improve your computing



112 WINDOWS VISTA

Find out what's new in Microsoft's latest OS

COMPETITIONS

192 Your chance to win one of three Silver Nikon Coolpix S1 cameras, or one of 10 Panasonic BL-C10 network cameras

FEATURE

112 Windows Vista
Better security, a graphics system and copy protection are just a few of the features in Microsoft's forthcoming operating system. Find out whether the beta version lives up to the hype

HANDS ON – Practical how-to advice

121 Contents

122 Question time
Our experts can help find real-world solutions to your everyday problems

126 Hardware
Let graphical character-based displays help you monitor system information

128 Performance
Reduce the noise and power consumption of your PC

130 Windows
Create a shortcut toolbar with 'new document' links

132 Linux/Unix
Some simple shell scripting to help you automate a tedious task

136 Digital imaging & video
Use digital filters to produce colour shifts, tonal changes and other effects

138 Word processing
Restore useful features that have been removed by developers

139 Spreadsheets
How Excel's Analysis Toolpak can make it easy to investigate data

140 Web development
Roll out your own news feed using RSS

143 Networks
The hardware, software and practicalities of virtual private networks

145 Databases
Generate reports with flexible queries

147 Visual programming
New tools from Microsoft put the fun back into programming

149 Future of virtual PCs
Find out how next-generation CPUs will enable everyone to run virtual PCs

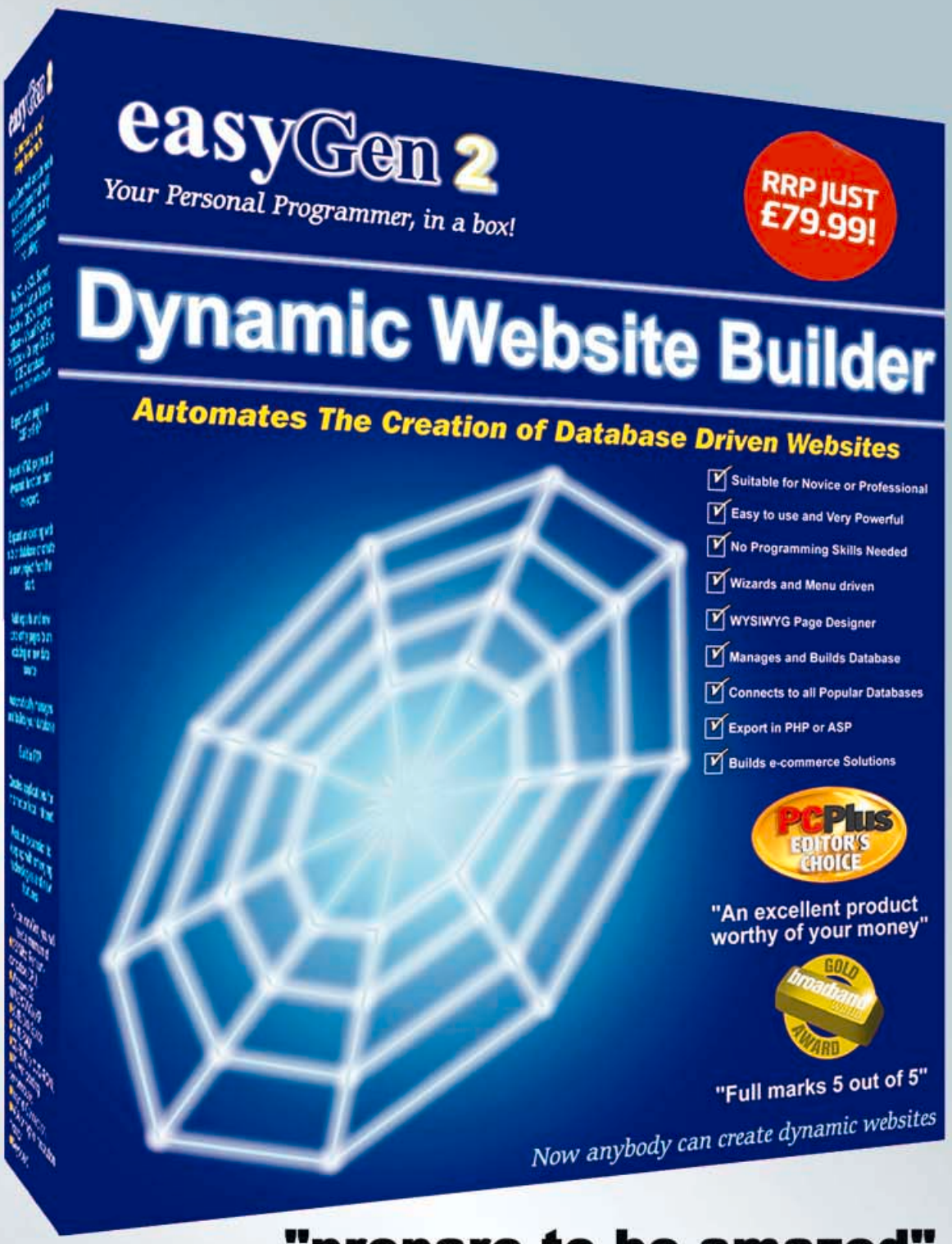
BUYER'S GUIDE NEW

A listing of the best products PCW has tested, helping you to make the right decision when planning a purchase

153 PCs
154 Graphics cards; notebooks
155 Motherboards; soundcards
156 Hard drives; DVD drives
157 Digital cameras; camcorders
158 Printers; scanners
159 Routers; speakers
160 Monitors; TV tuners
161 Digital music players; Smartphones; PDAs
162 Portable media players; Personal video recorders
163 Backup software; Digital image-editing software; Media creation software; PC maintenance software
164 PC security software, Office software; Video-editing software
165 Product index

COVER DISC

11 & 181 Five full versions
Genie Backup Manager 6 Personal; Serif Pageplus 7; BB Flashback Express 1.4.5; Cyberlink Power2Go 4 VCD; E-txt Msg Manager 4.5.2 and much more



"prepare to be amazed"

PCPLUS Magazine

PCPlus EDITOR'S CHOICE

COMPUTER SHOPPER

GOLD broadband AWARD

RECOMMENDED

SERVICE PROVIDER WEEKLY EDITORS CHOICE AWARD EasyGen 2

Personal Computer World RECOMMENDED

For more information and a FREE download visit

www.easygen.com

PC WORLD The Computer Superstore

amazon.co.uk

Symbiant

www.symbiant.co.uk

© Copyright 2005 Symbiant. All rights reserved. easyGen® is a registered trademark of Symbiant

Editorial

rob_jones@vnu.co.uk

PCW's fresh look will give our readers more

We've made some changes, but don't worry, old favourites are still here, says Rob Jones

Here at *PCW* we have a passion for technology. We live and breathe it. We use it, see it and play with it every day. Pick up *PCW* and you will get technology from cover to cover, whether you're reading about the hottest products on the market, hearing expert opinions that fire your technology juices, getting the best buying advice on the market, receiving help to dig you out of a technical hole or advice on how to use a product better.

So while summer is often considered to be a quiet time in many industries, here that couldn't be further from the truth. We felt it was time to introduce some changes, making the magazine easier to read and giving you more practical and in-depth technology advice. *PCW* has always enjoyed reviewing both new products and new technology, but we wanted to give you more on what these advancements will mean to you. So, we have spent the summer working on a major redesign of the magazine and website.

A number of readers in Manchester and London got a look at our 'beta' version, which was broadly well received. Where readers were less keen, we listened and rethought our approach, to ensure we provide you with a well-rounded magazine that entertains and informs you. Our thanks go out to the readers who took the time to help us shape the new-look *PCW*.

'The Adviser will help resolve problems and explain your rights, as well as give advice'

You will find new sections, and a couple gone – but the old favourites are still inside. Hands on definitely falls into the 'old favourites' bracket. We felt changes were required but not to the contributors, the subjects we cover or their depth of intelligence. You will find all the hardcore information Hands on has always carried but it is now easier to read. Our aim is to continue to inform experienced readers but to pass that knowledge and enthusiasm on to new readers as well.

The same goes for reviews. We've brought single product reviews and group tests together under one banner and made our verdicts clearer and easier to understand. This will make it easier to find the products you are interested in and when combined with our new Buyer's Guide, be a powerful tool to help you not only keep up with new technologies but also to make your purchasing decisions.

Another new addition is The Adviser, our reader watchdog. When readers experience problems with manufacturers or services we often help behind the scenes, but don't write about the outcome. The Adviser will help resolve problems and explain your rights and what you cannot expect, as well as pass on advice for buying products, whether online or in a shop. It will help you understand where consumer law protects you and where your demands are unrealistic.

Online, we have revamped our home page, making it quicker and easier to find reviews. We also update the news daily on our site, plus you'll find our labs blog, The Test Bed. This gives regular insights into what's in our labs, products we are seeing and gossip we hear. Plus you'll find extensive performance test results and some lively debates among the community of readers. The site also has an extensive range of software downloads and, through our links with Kelkoo, will help you find the best possible prices for any product you may be interested in.

We hope you enjoy the new-look *PCW*, but let us know what you think at letters@pcw.co.uk. **PCW**

We are always happy to hear from you – email us at letters@pcw.co.uk

→ **For daily news updates, reviews and downloads**
www.pcw.co.uk

Editorial Tel 020 7316 9000 • Fax 020 7316 9313
Subscription enquiries Online via our secure website: www.subscription.co.uk/help/vnu
Email vnu@subscription.co.uk • Tel 01858 438 881
Back issue and cover disc orders Tel: 01858 438 883 For full contact details see page 194

Enter the New Era of PC Gaming

NVIDIA GeForce 7800GT GV-NX78T256V-B

- Powered by NVIDIA GeForce 7800GT VPU
- Supports PCI Express and 20 pipelines
- Microsoft® DirectX® 9.0C and OpenGL® 2.0 support
- Integrated with the industry's best 256MB GDDR3 memory and 256-bit memory interface
- Features dual DVI-I / D-sub (by adapter) / TV-OUT
- Supports HDTV function and HDTV cable enclosed
- Supports VIVO function for video editing

NVIDIA GeForce 6600GT GV-NX66T256D

- Powered by NVIDIA Dual GeForce 6600 GT VPU
- Supports PCI Express and 8 pipelines
- Supports Twin-view display output
- Microsoft® DirectX® 9.0C and OpenGL® 1.5 support
- Integrated with the industry's best 256MB GDDR3 memory and128bit memory interface
- Features dual DVI-I / D-sub (by adapter) / TV-OUT
- Supports HDTV function and HDTV cable enclosed
- Unique Silent-Pipe design

NVIDIA GeForce 6600 GV-NX66256DP

- GIGABYTE's Turbo Force Edition
- Supports PCI EXPRESS and 8 pipelines
- Supports Microsoft® DirectX® 9.0c
- 256MB DDR /128-bit
- Supports Gigabyte "V-TUNER 2"
- Unique Silent-Pipe Design
- Supports HDTV function and HDTV Cable enclosed
- DVI-I / D-Sub / TV-Out

G.B.T. TECH CO. LTD.(UK)
http://www.gbt-tech.co.uk

* These speed settings are not guaranteed by GIGABYTE.
-- The specification and pictures are subject to change without notice.
-- All trademarks and logos are the properties of their respective holders.
-- Any overclocking is at user's risk, Giga-Byte Technology shall not be responsible for any damage or instability to your processor, motherboard, or any other components.

For more information, please contact our dealer :

http://www.3bsystems.co.uk/
http://www.a2zcomputers.co.uk/
http://www.advancetec.co.uk/
http://www.ambros.co.uk/
http://www.aria.co.uk/
http://www.aslweb.co.uk/
http://www.ballicom.co.uk/
http://www.computerorbit.co.uk/
http://www.cubsuk.com/
http://www.dabs.com/
http://www.ebuyer.com/
http://www.eclipse-computers.com/
http://www.indywareltd.co.uk/
http://www.fastekcomputers.co.uk/
http://www.girotech.com/
http://www.gladiatorcomputers.com/
http://www.idealcomputing.co.uk/
http://www.micro-logic.com/
http://www.microdirect.co.uk/
http://www.overclock.co.uk/
http://www.overclockers.co.uk/
http://www.planetmicro.co.uk/
http://www.rlsupplies.co.uk/
http://www.scan.co.uk/
http://www.simply.co.uk/
http://www.stak.com/
http://www.taitcomponents.co.uk/
http://www.thepcbusiness.com/
http://www.xtreme-hardware.co.uk/
http://www.yoyotech.co.uk/

Computashop 0207 2553255
Northants Computers 01536 522466

GIGABYTE™ TECHNOLOGY

www.gigabyte.com.tw

Upgrade Your Life™

NOVEMBER 2005
COVER DISC

Let our workshops show you how to use some of the software on the CD and DVD

see page 182
see page 185
see page 185
see page 184

see page 186
see page 183

ON THE CD & DVD

Genie Backup Manager 6 Personal

Protect your valuable data and files. Follow our workshop and start backing up your most important files fast

For workshop see page 182

Serif Pageplus 7

Get creative with this desktop publishing tool, and our step-by-step guide shows you how to create a newsletter easily

For workshop see page 183

BB Flashback Express 1.4.5

Record what's happening on your screen so you can create presentations, build slideshows or design a software tutorial

For workshop see page 184

Cyberlink Power2Go 4 VCD

Burn files to disc, create an image file, use audio options such as creating playlists automatically, and create Video CDs

See page 185

E-txt Msg Manager 4.5.2

Send text messages to your clients rather than getting caught in spam filters by using email

See page 185

EXCLUSIVE TO THE DVD

Roxio Recordnow Deluxe LE

Copy CDs, create audio discs, back up your key data and more, and discover three ways to speed up CD creation

For workshop see page 186

Linux and open source

Your chance to try Gentoo 2005.1 and Mandriva 2006 Beta 3

Plus

A trial version of Paragon Partition Manager 7, plus software from the magazine, game demos and much more

PLUS MUCH MORE!

FOR A FULL LISTING OF SOFTWARE TURN TO PAGE 181

The UK's most attractive PC Deals

BUY NOW, PAY 6 MONTHS LATER
see terms†

Matrix Inspire

E-Direct e1010

The Ultimate Best Buy TFT Flat Panel PC Offer

- AMD Athlon™ CPU 3000+ with HyperTransport™ Tech
- Microsoft® Windows® XP Home Edition
- ASUS 939 Pin PCI Express Mainboard
- 512MB DDR 400 Memory
- 160GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 17" TFT Analogue Flat Panel Monitor
- Direct 2D/3D Graphics (SMA*)
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- Logitech Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£499 INC. VAT **£424.68** EX. VAT

Matrix Premier

E-Direct e1020

Great Value PCI Express Enabled System

- AMD Athlon™ CPU 3500+ with HyperTransport™ Tech
- Microsoft® Windows® XP Home Edition
- ASUS 939 Pin PCI Express Mainboard
- 1GB (2x512MB) DDR 400 Memory
- 200GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 17" TFT Analogue Flat Panel Monitor
- 128MB ATI X700 PCI Express - DVI & TV Out
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Sound Blaster SBS260 Speakers
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£699 INC. VAT **£594.89** EX. VAT

Matrix Vector

E-Direct e1040

AMD Athlon™ Dual Core CPU with 19" TFT

- AMD Athlon™ 64 X2 Dual-Core CPU 3800+ HyperTransport™
- Microsoft® Windows® XP Home Edition
- ASUS A8N-E 939 Pin PCI Express Mainboard
- 1GB DDR 400 Memory (2x512MB)
- 250GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 256MB NVIDIA GeForce 6800LE PCI Express - DVI & TV Out
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Soundblaster Audigy 2 ZS
- Creative Labs Inspire 7.1 - 7900 Speakers + Subwoofer
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£999 INC. VAT **£850.21** EX. VAT

£100 OFF

Matrix Inspire Plus

E-Direct e1015

All the Inspire features plus these upgrades

- AMD Athlon™ CPU 3200+ with HyperTransport™ Tech
- Microsoft® Windows® XP Home Edition
- 1GB (2x512MB) DDR 400 Memory
- 200GB Serial ATA (150MBps) Ultra Fast Hard Drive
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Sound Blaster SBS260 Speakers

£599 INC. VAT **£509.79** EX. VAT

Matrix Premier Plus

E-Direct e1025

All the Premier features plus these upgrades

- Microsoft® Windows® XP Home Edition
- 250GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 256MB NVIDIA 6800LE PCI Express - DVI & TV Out
- Creative Labs Inspire 5.1 - P5800 Speakers + Subwoofer

£799 INC. VAT **£680.00** EX. VAT

Matrix Vector Plus

E-Direct e1045

All the Vector features plus these upgrades

- AMD Athlon™ 64 X2 Dual-Core CPU 4200+ HyperTransport™
- Microsoft® Windows® XP Home Edition
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 256MB ATI X800 PCI Express - DVI & TV Out

£1149 INC. VAT **£977.87** EX. VAT

PC Common Features (unless otherwise stated) • **Logitech Internet Cordless Keyboard & Optical mouse** • 5.1 Surround Sound 6 Channel Audio • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • MS Works 8 • eTrust Antivirus v.7 - 90 day Trial • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 (OEM product) • MESH Classic Warranty (12 month back-to-base, see terms)

MESH Extended Desktop Options - All Warranties subject to terms and conditions

- For more details on the Support Package best suited to your needs, call or click on the "Warranty" button on each system page of our website

Upgrade to the Support Package right for you

- Every PC is provided with the MESH Classic Warranty, which includes a 12 months back-to-base term (base unit only), 24x7 on-line support, free parts and labour, system restore facility and national rate hardware support. However you might prefer an extended support package for the life of your PC.

Choose from the following packages:

MESH Classic Plus Warranty
As Classic, but includes;
- 24 Months Back-to-Base (UK mainland)

Cover cost: £39 inc.Vat

MESH Advantage Warranty
As Classic, but includes;
- 1 Yr On-site + 2 Yr Back-to-Base (UK mainland)
- A single PC health check during the period of cover

Cover cost: £99 inc.Vat

MESH Premiere Warranty
As Advantage, but includes;
- "Total Cover", unlimited parts & labour 3 Year On-site (UK mainland)
- Priority Repair or Replace Policy
- 3 Mth National Rate Software Support

Cover cost: £199 inc.Vat

AMD 64 Athlon

Microsoft Office
60 Day Trial on all PCs

All pictures for illustration purposes only. *Shared Memory Architecture.
**Sony Multi-burners R/W all standard formats Except DVD-RAM

Get the PC you really want @ www.meshcomputers.com

Or Call 08700 46 47 47 • showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm

There are many imitations but only one MESH...

leading the way with award winning PC offers and accessories.

MESH recommends Microsoft® Windows® XP Professional

Optical Storage Technology by Sony

Elite A6

E-Direct e2020

High Performance Elite PCI Express 915G PC

- Intel® Pentium® 4 Processor 650 with HT Technology (3.4GHz Prescott 64-bit CPU, 1MB L2 Cache, 800 FSB)
- Microsoft® Windows® XP Home Edition
- ASUS P5G 775 Mainboard HT Ready
- 1GB DDR 400 Memory (2x512MB)
- 250GB Serial ATA (150MBps) Ultra Fast Hard Drive
- Intel® Graphics Media Accelerator 900 224MB Max (SMA*)
- 17" TFT Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£699 INC. VAT **£594.89** EX. VAT

Venture

E-Direct e3030

Affordable Notebook ideal for student/college user

- Intel® Celeron™ Processor 2.66GHz
- Microsoft® Windows® XP Home Edition
- 15.1" TFT XGA Active Colour Screen (1024x768)
- 512MB DDR 400 Memory
- 60GB ATA-100 EIDE
- 64MB Integrated graphics memory
- Combo DVD-ROM/CDRW
- Built-in Video Camera
- Built-in 802.11g Wireless LAN Card
- 3D Stereo Sound with internal Speakers

£599 INC. VAT **£509.79** EX. VAT

Dynamo M550G Pro

E-Direct e3055

A well featured Mobile Centrino based Notebook

- Intel® Mobile Centrino Celeron™ Processor 360 (1.4GHz)
- Microsoft® Windows® XP Home Edition
- 15.1" TFT XGA Active Colour Screen (1024x768)
- 1024MB DDR/DDR2 400/533MHz Memory
- 80GB ATA-100 EIDE
- Intel Media Accelerator 900 graphics memory
- Multi-Burner 8x DVD-RW/48x CD-RW
- Built-in 802.11g Wireless LAN Card
- Built-in 4-in-1 Smart Card Reader
- 3D Stereo Sound with internal Speakers

£699 INC. VAT **£594.89** EX. VAT

Elite A6 Pro

E-Direct e2025

All the Elite A6 features plus these upgrades

- Microsoft® Windows® XP Home Edition
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 19" TFT DVI Flat Panel Monitor

£799 INC. VAT **£680.00** EX. VAT

Common Features of Elite A6 as Matrix Series (previous page)

Ultima 15"

E-Direct e3025

All the Venture features plus these upgrades

- Intel® Pentium® 4 Processor 530 (3.06GHz)
- Microsoft® Windows® XP Home Edition
- 15.1" TFT SXGA+ Active Colour Screen (1400x1050)
- 128MB DDR ATI Radeon M11 AGP 8x Graphics
- Multi-Burner 8x DVD-RW/48x CD-RW

£799 INC. VAT **£680.00** EX. VAT

System includes Works 8.0 - Full specification details are available on-line

Dynamo Plus

E-Direct e3070

All the Dynamo features plus these upgrades

- Intel® Pentium® Mobile Processor 740
- Microsoft® Windows® XP Professional Edition
- 15.4" TFT WXGA Active Colour Screen (1440x900)
- 128MB DDR NVIDIA GeForce Go 6600 PCI Express

£899 INC. VAT **£765.11** EX. VAT

Upgrade Dynamo Plus to WSXGA 1680x1050 for (£100) £999 inc. VAT

Recommended Best Buys - Go on-line or call for further details

Logitech USB Headset 30
PC Headset with microphone and volume control - includes access to 120 minutes FREE calls using the SKYPEOUT service

£29 INC VAT

OneClick Intelligent Mains Panel
An innovative new product for use in the home or office. Control the power to your peripherals with just one click.

£35.25 INC VAT

Norton Internet Security™ 2005
(includes Norton AntiVirus)
Essential protection from viruses, hackers and privacy threats. (Full version - OEM)

£39 INC VAT

Inovix Portable DVD & DivX Player with remote
Compact & portable DVD player complete with mini remote control. Also includes car charger, carry case/ car head-rest holder & TV input cables

£110 INC VAT

V-Stream Xpert DTV-DVBT USB - Digital TV Tuner
Television receiver for access to free-to-air digital terrestrial TV and radio signals - for Desktops & Laptops

£57 INC VAT

Sony 19" Flat Panel LCD PC/TV Display MFM-HT95
Sony bring you an integrated TV tuner, HDTV connectivity, SRS WOW™ 3D Audio Technology & flexible TV/PC connectivity.

£549 INC VAT

Please Read: Sales subject to terms & conditions (copy available on request). Pictures shown for illustration purposes only - colours may vary. Operating System supplied is an OEM product - Full version. VM/Micro Case's purchased with internal Card Reader benefit from only 4 free USB 2.0 ports. *SMA (Shared Memory Architecture) allows for memory to be taken from RAM to supplement the graphics card requirements. **Sony Multi-burner R/W all standard formats Except DVD-RAM. MESH Standard Warranty (Classic) - All PCs carry a 12 Month Back-to-base, Parts & Labour Warranty as standard (MESH standard terms and conditions apply). Pick up & collection is available from MESH at £50 inc. VAT. Warranty upgrades & extensions are available and full terms are provided separately. Notebook Warranty: 12 Months Parts and Labour, Collect and Return Warranty (UK Mainland only) - excludes battery. Non-BT customers please check that the modem will work on your line before ordering. Prices quoted for calls to MESH are based on a BT landline - other carriers may charge you more. Our minimum standard delivery charge is £45.83 inc (UK Mainland Only). Please call for a written quotation. ©2004 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, AMD Athlon, and combinations thereof, are trademarks of Advanced Micro Devices, Inc. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries. All trademarks are acknowledged. E&OE. Prices correct at time of going to press (24/8/05). Business hours Mon-Fri 9am-6pm; Sat 10am-5pm. Finance Option - †Interest is calculated from day of purchase. No deposit required. Credit is subject to status to UK residents aged 18 years or over. Credit is provided by GE Capital Bank Ltd, 6 Agar Street, London. WC2N 4HR. Goods provided by MESH Computers Plc, Unit 1 Oxgate Centre, Oxgate Lane, London, NW2 7JA.Typical 29.9% APR (variable)

MESH computers plc

ORANGE SPV C550 Check out this Windows-based smartphone – see page 48

NEWS

IN THIS SECTION

NEWS

16 Hackers 'create open MacPC'
Fujitsu sends in the SAS
17 Back-to-school notebooks
18 Google offers web calls
Web mags go local
20 O_2 trials true mobile TV
21 Coffee cuts call costs

IDF REPORT

22 New entertainment PC
How to make cool chips
Intel buys into anti-virus
23 UK superchip trounces Xeons
PCIe bus to double speed

ANALYSIS

24 Microsoft's new Office file formats

Keep up to date with the news, reviews and competitions in our weekly newsletter.
To subscribe go to www.vnuservices.co.uk/pcw

Intel drive for frugal chips

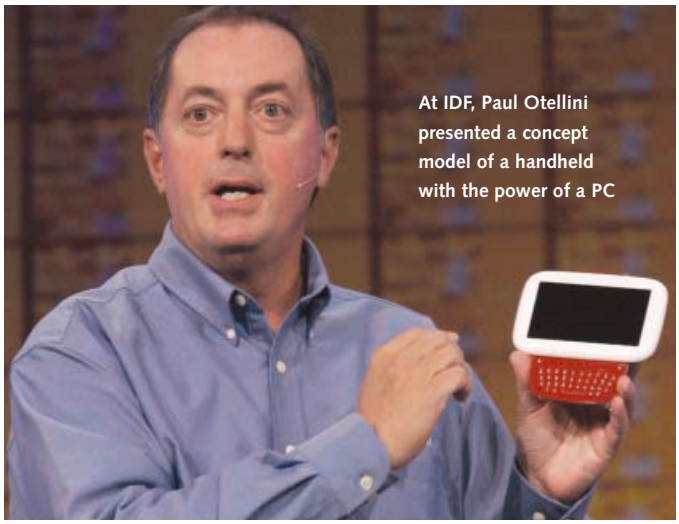
Intel signalled a major change in the design of its chips last month with a shift of focus from speed to power efficiency. Chief executive Paul Otellini said performance per watt will replace GHz as a chip rating. Power was already an issue back in 2000, when Transmeta launched the low-drain Crusoe, showing that processors could run on lower power.

Crusoe forced Intel to address the issue, leading to the Centrino notebook platform. But there remained the absurdity of P4-based entertainment centres wheezing because of the need for cooling fans. Intel will now address the power budget on all platforms.

Otellini said putting multiple processors into one chip had let the company boost performance without pushing up consumption. Now it was tackling the core micro-architecture to combine the best of the P4 and mobile Pentiums, designing chips for power efficiency without compromising on required performance.

Three new dual-core 64bit chips will be launched next year, power-optimised for the platforms at which they are targeted; they are codenamed Woodcrest for servers, Conroe for desktops and Merom for laptops. Merom will have three times the performance per watt as the first Centrino processor; Conroe will deliver five times that of the 2002 Northwood generation of the P4; and Woodcrest would bring a three-times improvement. The new chips will be made using 65nanometer technology rather than today's 90nm.

Subnotebook chips out late next year will be rated at 5w, desktops at 65w and servers at 80w TDP (thermal design power, the flat-out maximum for which the casing and cooling has to be designed).



At IDF, Paul Otellini presented a concept model of a handheld with the power of a PC

The technology will lead to a new class of handheld device with the power of a PC, Otellini told the annual Intel Developer Forum (IDF). He showed a tiny concept model (above) capable of running Vista, the successor to Windows XP (see p112).

He also predicted that power consumption on such mobile chips would be reduced by a factor of 10. On server processors the number of cores will go into double digits, giving 10 times the performance on a tenth of the power. *CA*

→ **See IDF reports, pages 22 and 23**

Broadband set for 50 Mbits/sec

BROADBAND speeds available in the UK hit a claimed 24Mbits/sec last month – and cable provider Telewest predicted that they could reach 50Mbits/sec within two years.

London startup Be (www.bethere.co.uk) was offering a 24Mbit service to early adopters for just £20 a month using new ADSL2+ technology, although you would have to be on a good line close to an exchange to get the top speed.

Even the Be upstream speed, critical for tasks such as surveillance and video calls, is higher than that of most providers at 1Mbit/sec. BT has boosted its minimum data rate to 2Mbits/sec with no increase in charges.

The challenge of ADSL2+ technology, which will be deployed at phone exchanges across the country over the coming months, has forced the cable companies to improve their offerings.

NTL has standardised on 10Mbits/sec on all its cable links with no price increase. Telewest will roll out increases to 2Mbits/sec entry-level service and 10Mbits/sec premium.

Telewest spokesman John Moorwood said speeds could rise to 50Mbits/sec by 2007 with the advent of Docsis 3 (a new version of the protocols used on cable links) or the possible introduction of Ethernet to the home. He added: 'Ethernet would mean you could do without the cable modem. You would plug straight in just like on an office network.'

The faster data rates are viable as it is volume rather than speed that operators have to pay for. The speeds will also make revenue-generating services, such as TV on demand, much more viable.

Mains data air safety watch

A faster generation of devices that turn household mains wiring into network links has hit the market, despite fears they may be a danger to aircraft.

The devices use a low-power high-frequency signal that is filtered off from the low-frequency mains AC. The problem is that the wire acts as an aerial and can interfere with radio reception.

In fact, the technology is in many cases a wireless link in disguise. Household wiring consists of a set of loops, typically two per floor: one driving the pocket sockets and the other the lighting.

Peter Huddlestone of power-over-mains specialist Devolo confirmed that the connection between loops is wireless. 'The wires have to run close to each other for at least a metre for it to work,' he said.

Interference expert Jonathan Stott, of the BBC's R&D Laboratory, suspects radio plays a part even on a direct link, with RF being transmitted at one end and absorbed at the other.

The devices satisfy EC interference regulations and vendors say they can get round problems with amateur, commercial and BBC broadcasts. However, Stott says EC rules ignore the possible effect of thousands of them in cities – and he fears passing aircraft may be vulnerable because there are no buildings in the way to block the signal.

The Civil Aviation Authority, which is responsible for air safety, said in a statement it was 'fully aware of mains data devices' and was monitoring the situation closely. It added: 'We will not be taking a position on it until there is something more tangible to assess.'

Here are two of the new generation of devices that turn a mains plug into an Ethernet port. PCW has tested the Corinex AV-200 for speed and will print a full review after RF tests. It is rated at 200Mbits/sec but in our tests it only achieved 45Mbits/sec, which may have been due to noisy lines. Still, that is more than the real throughput of Wifi and easily fast enough for video. The AV-200 costs £80 ex VAT from www.broadbandcarrier.net – and you will need two for a connection.

Devolo is selling a backwards-compatible adapter using a fast (rated 85Mbits/sec) version of the 14Mbits/sec Home Plug technology used in most products sold today. A starter kit with two plugs costs £116. Products using a new 200Mbits/sec Home Plug specification are due out next year.

Key moves as more phones start to sing

Music on the move was in the news last month, with HMV and Microsoft launching a download service to rival Apple's Itunes. The two services are not compatible and HMV's requires the use of Creative and I-river players.

Apple was expected to launch an Ipod phone in partnership with Motorola, bowing to the common view that there is little point in having a separate player and mobile. But other companies had already beaten it to the market (see page 21).

There has been a surge in sales of mobile phones – 21.6 per cent in the three months up to June – as people replaced old handsets, according to analyst Gartner. But they have been shunning 3G models, apparently because of a lack of interest in 3G services.

However, the latest models, to be launched in time for Christmas are slimmer and lighter than the first 3G handsets and may tempt more buyers.

Another trend, prompted by the success of Blackberry email-on-the-move, is towards phone/PDAs with mini keyboards. The most elegant is the new O_2 XDA Executive, which has a swivel top similar to a tiny Tablet PC.

Both the XDA and T-Mobile's MDA Pro run Windows Mobile 5.0 and support 3G, GPRS and Wifi, and have twin cameras (one for video calls).

The MDA costs up to £399, depending on contract. At the time of going to press, no prices were available for the XDA.

T-Mobile's MDA Pro runs Windows Mobile 5.0

O_2's XDA Executive has a swivel top to give it a tiny Tablet PC look

In brief

Office politics

The US state of Massachusetts has unveiled a plan to replace Microsoft Office with a suite that supports Open Document, an open standard set by the Oasis organisation. Chief information officer Peter Quinn said state agencies should plan to migrate to Open Document by 2007.

→ **New formats – see page 24**

DVD tops out

Panasonic and Hitachi-LG Data Storage 16-speed drives have reached the upper limit of recording speeds for now, says Panasonic. 'Any faster and even the best media might break apart. It's revolving at 11,000rpm,' said Anthony Jasionowski, group manager of strategic planning.

Local films on tap

Google has introduced a feature that lets you check out films showing in your area and read reviews – see its UK site for details. For more search engine news and another bid to localise the web, see page 18.

In brief

Simple surrounding

Surround sound can do wonders for your home entertainment system but it can be a hassle with multiple leads running around the room. Not so with Yamaha's YSP-800 sound projector, which has 22 speakers to focus sound around the room to give a similar effect to multiple speakers. A system called Intellibeam automatically tunes the system to your room, monitors the output and adjusts the settings if necessary. The YSP-800 costs £599.

PC prices to drop

The average PC price will drop by 10.8 per cent this year, followed by another 8.6 per cent drop in 2006, according to analysts Gartner. But increased sales will boost the revenues of PC makers by 0.5 per cent this year, though there will be a 0.4 per cent drop in 2006.

2GB SD card

Kingston has launched an ultrafast 2GB SD Ultimate card costing £105 ex VAT.

→ **www.kingston.com/ukroot**

SIM backup

Imation is bundling a 32KB backup device for phone Sim cards with its 1GB, 2GB and 4GB USB drives.

→ **www.imation.com/uk/sim**

Powerful access

D-Link has launched a Wifi 11g access point supporting the 802.16 Power over Ethernet standard, allowing it to draw power from a compliant network link – see page 107. The £206 Airpremier DWL-3200AP offers enterprise-class security.

Hackers 'create open MacPC'

Hackers claim to have found a way of running the forthcoming Intel-based Mac OSX operating system on a non-Apple PC. They say on some PCs it appears to run faster than the version on current G5 Macs.

Apple chief executive Steve Jobs caused a sensation earlier this year when he told notoriously anti-Wintel Mac enthusiasts he was dropping their beloved PowerPC chip and had ported the OS to the classic x86 PC platform.

It seemed the company would restrict what was quickly dubbed OSx86 to run exclusively on hardware sold by Apple, continuing the policy it followed with the old Mac OS. This gives Apple revenues from both hardware and software and avoids the need to match the global compatibility of Windows (hence the Mac's reputation for reliability). But it has also led to high prices for systems and peripherals and corralled the Mac into a minority market.

A version of OSx86 distributed to developers will run only on Apple machines certified with the aid of a Trusted Platform Module (TPM) chip, according to the unofficial OSx86 Project site.

It reported that a pirated version of this developer edition, tweaked to avoid the TPM check, had been distributed on a file-sharing network and run successfully on a number of PCs and notebooks.

However, some observers feel the hack was a little too easy and smell an Apple plot. Arguably, Apple could make more money by doing a Microsoft, leaving hardware to other companies and selling only software for what is by far the world's most-used computing platform.

They believe Jobs meant to let OSx86 leak out onto non-Apple PCs and then give in to calls for an open hardware platform, neatly finessing Mac fanatics who complain he has already sold out to Intel.

This might seem a little too devious but it would mean every PC could be sold with the choice of Windows or the Mac OS, and it would certainly give Microsoft something to worry about.

Will OSx86 pass security test?

MACPCs could be a better buy than Windows machines for many family users because they offer better facilities out of the box for tasks such as home video and photo editing. They could even make an impact in the corporate world, as the Mac OS is underpinned by the Unix operating system that is still used in enterprises.

Whether the Mac OS is inherently more secure is open to debate because Windows is attacked more. It is certainly not immune. Apple has just released a set of patches that fix 44 security flaws, including openings for the kind of buffer-overflow attack that has plagued Windows machines.

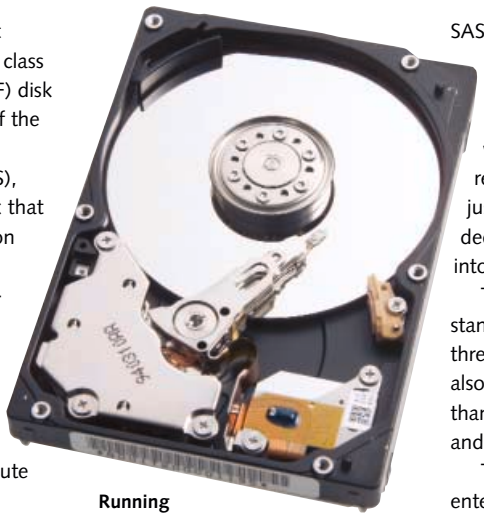
Security website Secunia has rated the release as 'highly critical', its second highest security rating.

Fujitsu sends in SAS to speed up drives

Fujitsu has launched the first production models of a new class of fast small form factor (SFF) disk drive using a serial version of the venerable parallel SCSI link.

Serial Attached SCSI (SAS), like the Serial ATA (Sata) link that has superseded the old ribbon cables in PCs, has been developed because, counter-intuitively, data can be sent faster down one cable than it can be by splitting the stream across several. This is due to an effect called 'bit skew', during which minute differences in the timing of parallel strands corrupts data at very high speeds.

Sata and SAS connectors are physically similar and a Sata drive will work with an SAS link. The reverse is not true, however, and a slug on an SAS link prevents it being plugged into a Sata connector. Both links are rated at 3Gbits/sec today, but SAS is expected to hit 12Gbits/sec by 2010.



Running cool... an SFF drive

Fujitsu's new MAV2036RC and MAV2036RC SFF drives, with 36GB and 106GB respectively, are 2.5in wide by just over half an inch (15mm) deep, enabling two of them to fit into a 5.25in drive bay.

Ten can also be packed into a standard rackmount that takes just three 3.5in drives. An SFF drive also uses 40 per cent less power than a 3.5in, cutting running costs and reducing heat.

The drives are aimed at the enterprise market but the format could trickle down to slimline desktops and other devices. Andrew Batty, Fujitsu marketing manager, said Seagate is releasing a similar drive so that companies would have a choice of suppliers.

Notebook line-up for students

Notebook vendors have been lining up affordable models to tempt students starting college or the new school year.

HP launched a range with prices starting at £499 for the Pavilion ze2200 and Compaq m2200, both of which come with a six-card reader, DVD burner and 15in screen. The entry-level models use AMD Sempron 2800+ processors.

The £699 Pavilion dv1300 doubles as an entertainment centre, with a quickplay feature that boots straight into a Linux shell, allowing you to play music or watch a DVD without having to open Windows.

The Pavilion dv8200 (pictured) is more stylish and pricey at £999, but it has a 17in widescreen, ATI Radeon X600 graphics, a Pentium 600-series processor, and a full-size keyboard, complete with a rarity for a notebook – a numeric keypad. HP plans to program a hotkey to summon the Windows calculator for use with the keypad – useful for science students.

The stylish Pavilion dv8200

HP regards Tablet PCs as corporate products, but Toshiba is selling its Satellite R10 through selected Dixons and PC World branches. It is reasonably cheap for a tablet PC at £999, including a 14.1in screen and multi-format DVD burner.

No precise specifications have been announced, but the R10s are sold with either 1.6GHz or l.7GHz processors. A big drawback is that the R10 weighs 2.85kg, which is a lot to carry about. On the positive side, it does come with Microsoft's One Note utility, which synchronises recordings with your note taking – great for lectures.

Why Toshiba is plugging this model in the UK rather than the smaller 12.1in Portégé M200, which weighs 1.1kg, is anyone's guess. The M200 is on sale here but you have to look for it and it's priced a little above the R10.

Eco-friendly laptop arrives

Fujitsu Siemens claims its Amilo Pro V2030 notebook (pictured) is the first to conform to EC eco-guidelines set out in the Restriction of Hazardous Substances (RoHS) directive, which is due to come into effect on 1 July 2006. Prices start at £513 for a Celeron-based model.

RoHS products must not contain hazardous substances such as lead, mercury or cadmium.

→ **www.fujitsu-siemens.com**

DrayTek Broadband Firewall/Routers

Wireless LAN Access with Enhanced WLAN Security

With the convenience of a wireless LAN you still want to protect both your data and your bandwidth. DrayTek Vigor wireless routers provide several independent methods of wireless security for encryption and client authentication, including WPA/WPA2 and 802.1x.

Voice-over-IP (VoIP)

DrayTek VoIP-equipped routers let you to use your broadband line to make and receive voice calls. Calls to or from any other VoIP-equipped users are completely free of charge (any SIP compatible device, software or network).

You can make low cost calls to regular phone lines too, using the DrayTEL PSTN gateway - calls to the PSTN are at very low DrayTEL rates (e.g. Europe/USA from just 1p/min) and DrayTEL will also provide you with a regular phone number to receive calls from regular phone users on. DrayTek VoIP routers are available for both ADSL and cable-modem broadband.

The phones connected to your Vigor can receive incoming calls via their SIP address from other Internet users or from the PSTN (the regular phone network) via your own DrayTEL telephone number.

Internet

PSTN

Make free Internet Voice Calls !

Firewall & VPN Facilities

The Vigor's famous Virtual Private Network (VPN) facilities enable you to link branch offices together or teleworkers to head office, easily, simply and securely. You can run up to 16 tunnels simultaneously, allowing remote users to access shared drives, data and other resources using your broadband connection. DrayTek VPNs use industry standard encryption systems, compatible with most other vendor's products.

Teleworker
Headquarters
Branch Office
LAN
Internet
VPN Scenarios

DrayTek's firewall facilities help defend your network and PCs not only against intrusion but also Denial-of-Service attacks and can block specific web site (by URL keyword), ActiveX components and other potentially harmful web content. Flexible IP filtering is also provided as well as comprehensive reporting facilities. See the DrayTek web site for details of all firewall and other features.

Available from SEG
020 8381 5500
VoIP : 800800@draytel.org

For full details of all models visit
www.draytek.co.uk

Specification subject to change. Facilities vary with model.

In brief

Eyeballing UK

Eye2eye is offering a DVD of 360° panoramic views created by a specially developed panoramic camera. It has also developed software that maintains perspective as you pan round. Eye2eye Britain Panoramic Edition costs £39.99 from Amazon, or download a demo from www.eye2eyesoft.co.uk.

Long-life batteries

Panasonic says its Oxyride batteries, which are said to last twice as long as standard products, are now on sale in the UK at Morrisons, Waitrose and Argos stores. The batteries, previewed at CES earlier this year, are targeted at digital camera owners.

Screenteacher

Softvoile has launched a screensaver that flashes up foreign words with their translation to help you learn a new language. Languages include Russian, English, Spanish, German and Italian. A trial version of Virtual Teacher Screensaver 2.1 is available at http://vteacher.net; registration costs $19.95 (£11.30).

Slim drive

Transcend has streamlined its portable hard drive products into the Slimline Compact Storejet 2.5 range. They cost €131 (£90) with a 40GB disk, €186 (£127) with 80GB, or €27 (£18.50) for a case in which you can insert your own disk.

Google calls open to question

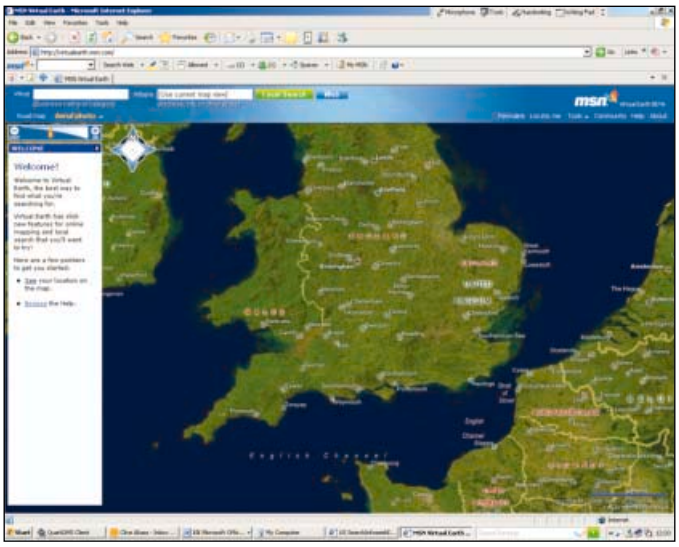
Google got so much publicity over the launch of its web telephony service last month that you'd have thought it had invented Voice over IP (VoIP) instead of playing catch-up.

In fact, voice calls are only one aspect of the new Google Talk, which includes a fairly basic instant messaging (IM) service (see preview, page 65). It does have one thing in its favour: it is based on an open standard called Jabber.

The services offered by AOL, MSN and Yahoo do not interoperate, leaving IM in a similar position to that of email in pre-Internet days, when you could only communicate directly with users of the same service. The same is also true of Skype, which uses its own protocols for web voice calls.

But these have too much invested in hooking users into their services to get involved with open standards, and even Google is unlikely to get everyone Jabbering soon. So instant messaging is unlikely to have a universal reach for some time.

Google Talk is the latest bid to break Microsoft's stranglehold on the Windows desktop, which is, in effect, a global marketplace. Both Google and Microsoft have revamped their desktop search engines, and both have released interactive atlases with satellite imaging (see screen above).



Microsoft's Virtual Earth atlas, still in beta, is not as good as Google Earth

Yahoo, which has teamed up with BT to offer VoIP and other messaging in the UK, has revamped the search facility in its email service.

Google is not quite the almighty that its reputation suggests though. It comes third to MSN and Yahoo in terms of the number of visits, according to a recent estimate, and its rivals tend to hold visitors longer.

This is why Google is diversifying into other areas – and messaging systems, including voice and video calls, are likely to rival the search engine as the most-used desktop item as telephony moves to the web.

But Microsoft is not standing still either. It has bought VoIP developer Teleo, which provides gateway services allowing VoIP calls to standard phones and mobiles using software integrated with Microsoft's Outlook and Internet Explorer.

Web magazines add a local perspective

Local papers have arguably never recovered from the influx of freesheets over the past few years. Sales of paid-for papers dropped, advertising revenue was reduced and the standard of journalism fell, with a few exceptions.

Yet community magazines have become something of a cottage industry. A company called Mymag claims to be responsible for the launch of 700, bundling news with a local business directory.

Many are run from home, and with an average circulation of 2,500 they have a combined circulation of nearly two million.

Mymag was founded by Nigel Botterill after he realised that a viable business model could be built around a community magazine run by his wife Sue. Now they have moved the idea to the web, with a company called Thebestof.

Southport news hosted by Thebestof

The idea is that the company franchises out areas to local people who provide content and sell advertising space to local businesses. Posting ads and other content is done via a blog-type web interface.

Botterill says his company will buy paid-for Google slots to ensure anyone searching for any business listed in a franchise area will get a front-page listing. It will also buy in optimisation expertise. 'Many small businesses think that it is enough to stick up a website. Then they wonder why they don't get a hit.'

Thebestof is only one of many attempts to localise the web, but it does represent more competition for local papers. Whether it improves local journalism remains to be seen.

→ **http://thebestof.co.uk**

KONICA MINOLTA

Premium Colour For Power Users

Special Offer

Get an extra 2 years warranty (worth £274)
and a FREE Toner Value Pack
when you buy a
magicolor 2450

magicolor 2450

- A4 colour laser printer
- 5 ppm colour
- 20 ppm mono
- 600 x 600 x 4 dpi Photo ART contone
- Ethernet, USB 2 & Parallel
- 128 MB RAM
- PostScript Level 3, PCL 6 & PDF
- Optional duplex
- PictBridge
- Dimensions (DxHxW) : 395 x 341 x 430 (mm)

£449 ex VAT

MacUser

MAGICOLOR 2450 OVER THE UK

The magicolor 2450 is an ultra-compact colour laser PostScript compatible printer that delivers the best graphical performance in its class. Fast and with superb print quality, its power gives it wide-ranging compatibility, making it the ideal solution for the demanding, graphics-intense workloads of a small to medium-sized workgroup.

Contact us today! Phone : **01784 411 887** Web : **www.konicaminolta.co.uk/printer**

*Terms and conditions apply. Offer ends 30th September 2005. The The Konica Minolta logo, Crown, Photo ART and magicolor are trademarks or registered trademarks of Konica Minolta, Inc. All other trademarks are the property of their respective manufacturers. All specifications are subject to change without notice. E&OE.

Konica Minolta Business Technologies, INC.

The essentials of imaging

O_2 pilots mobile TV as BBC opens archive

The convergence of IT and broadcasting took two new turns last month with the news that more BBC radio and TV programmes will be available online, and that O_2 is to trial mobile TV broadcasts.

Orange launched a TV service in May using the 3G mobile-phone signal, but it is not broadcast and has to be paid for like other 3G content.

The Oxford-based O_2 trial uses DVB-H, a mobile version of the technology used for Freeview digital TV. It will be launched next month in partnership with Arqiva (formerly known as NTL Broadcast).

The business model of broadcast TV has yet to be established, but it could generate revenues from adverts and by providing a back channel for purchases.

DVB-H uses power-saving techniques to reduce battery drain, including switching on only during the one-sixteenth time slice carrying the channel being viewed. However, it is rivalled by DMB, the multimedia version of DAB (digital audio broadcasting).

Both can do the job, and which wins out will depend as much on industry politics and spectrum allocation as on technology. But improving battery life will also be critical to their success.

The BBC believes that the Internet, personal video recorders and portable media players will lead people to use TV and radio more like they read books – that is, almost anywhere and at times of their own choosing.

It is to launch an online service called MyBBCPlayer next year providing access to the past seven days of BBC television and radio plus 'an expanding proportion' of the BBC's archive, director-general Mark Thompson said at the Edinburgh International TV Festival.

But will it be simply TV?

AROUND 350 testers in the Oxford mobile TV trial will use the Nokia 7710 phone (pictured) to access any of 16 channels covering music, sport, news, comedy, soaps and drama. The idea is to investigate the viewing habits of people on the move, though how realistic the results will be with pilot content is open to question.

Mobile multimedia can make freer use of text than is feasible on TV because it is easier to read close-up on small screens. It could, therefore, evolve into a medium in its own right, with elements of traditional broadcasting content, newspapers and the web.

The TV viewing window on the 7710 does leave space for text on the side, which could be used for interactive adverts that may, in turn, develop into more innovative uses of the medium.

Call costs to be cut

Mobile phone users will be able to make calls at landline rates in places such as airports and railway stations from next year, if a new service gets off the ground.

A company called Coffee Telecom plans to offer the service at thousands of 'coffee zones' in public areas using frequencies to be auctioned off by regulator Ofcom for short-range GSM use.

Companies, colleges and other institutions will also be able to lease the service for communication on large campus sites, where charges for internal calls could be free. It will use frequencies between 1,781.7MHz and 1,880MHz that were originally left unallocated to create a buffer zone between bands used by GSM cellular and Dect cordless phones.

The service will be accessible by standard mobile handsets, according to Coffee founder and chief executive Martin Wren-Hilton.

Coffee users will either retain their existing Sim card and select the Coffee service manually when within range, or they will get a Coffee Sim that will automatically switch from their usual mobile operator when appropriate. They will be able to use any Coffee zone.

Wren-Hilton, who invented the mobile top-up card, says Coffee will give better voice quality than Skype VoIP (Voice over IP), which is free at some railway hotspots, because the licensed bands are far cleaner than unlicensed Wifi frequencies. The massive increase in mobile use has sent company telephony bills soaring, so that there is likely to be a lot of interest in any way to cut them.

Ofcom said the 'Dect buffer zone' auction is unlikely to happen before next spring. Between five and 10 licences will be sold and they are unlikely to fetch anything like the billions raised by the famous 3G auctions.

Mobiles get wireless stereo

NOTABLE among the latest handsets being shown off by vendors and operators ready for the Christmas market are several music phones, including the first Walkman phone, the Sony Ericsson W800i (pictured below left), available from T-Mobile and O_2, and the Samsung i300 (below right), which has a 1in 3GB hard disk capable of storing 1,000 songs.

O_2 is also to launch a pair of stereo Bluetooth headsets conforming to the A2DP profile, which allows them to be used for both telephony and music (see *PCW* October, page 21).

However, some of the new phones do not support A2DP, so check before you buy if you don't want to cart around two headsets.

Sony Ericsson's W800i (far left) is the first Walkman phone; and Samsung's i300 (left) can store 1,000 songs on its 3GB hard drive

Spat with AMD gets nastier

AMD takes delight in needling its rival around the time IDF is held, when developers and journalists from all over the world descend on San Francisco to get the lowdown on the latest Intel high technology. But this year the spat between the two became increasingly vitriolic.

On the day the forum opened, AMD took out full-page advertisements in major US papers challenging its rival to a public duel between a dual-core Opteron server and an Intel equivalent.

Intel scornfully declined the challenge – and days later filed a splenetic 63-page rebuttal of an equally bitter, if not quite as long, list of complaints in an anti-trust suit AMD filed in June. In this AMD accused its rival of using 'financial incentives' and threats to stop big system builders from using non-Intel chips.

The gist of Intel's response was that AMD had a reputation as an unreliable supplier and brought the troubles of which it complained on itself.

But critics said the document was short on answers to specific AMD accusations. Former federal trade commissioner David Balto told the *LA Times* that Intel was blaming the victim and that its response was like that of a child, as if saying 'We're not going to talk about whether we've engaged in anti-trust activities, but AMD's a stinky firm.'

Balto added: 'Under anti-trust law, that rarely carries a lot of weight.'

AVG purchase

In another post-IDF move, Intel and a private equity company bought a $52m (£28.5m), 65 per cent stake in the Czech firm Grisoft, which develops the AVG anti-virus product. One possibility is that it plans to hardware more anti-virus features into its chips, in addition to the recently introduced buffer overflow protection.

Viiv PC is built to entertain

MacDonald shows one possible Viiv form factor

Intel is to launch a platform tailored for entertainment PCs in the same way as Centrino chips and motherboards are designed for notebooks. The Viiv (rhymes with five) platform will include a dual-core processor and chipset optimised for the needs of Microsoft's XP Media Center operating system.

It will be the first Intel platform designed from the ground up for people who are 'passionate about the idea of accessing their content anytime, anywhere in their home on a number of devices,' said Don MacDonald, vice-president of Intel's Digital Home Group, at the Intel Developer Forum (IDF).

Viiv systems will range from modules such as hi-fi units to traditional desktop or tower designs. You will be able to turn them on and off like a TV, though they will take time to boot up, and will support 5.1 and 7.1 sound.

They will have a remote control, but a TV tuner is optional. If present, the PC will be able to record, pause, and rewind live TV programmes like a personal video recorder.

Viiv machines will come with a network configuration wizard, navigable by the remote control, to allow video and audio to be passed to portable media players, DVD players, TV sets and stereos. The first Viiv products are expected to ship early next year.

Cool ways to reduce chip power drain

Multicore processors have allowed Intel to boost processing speed without increasing clock frequencies, power consumption and cooling requirements. In addition, entire cores can be switched off to conserve power when not needed; and processing can be circulated around the cores to avoid hotspots.

But, as chief executive Paul Otellini pointed out (see page 14), major changes to the core architecture are needed to produce the tenfold reduction in power drain envisaged by Intel.

One approach is to use new materials to reduce both unwanted leakage currents and the charge required to switch on a transistor.

Another is to use two types of transistor, one fast but high leakage and the other slower but less power hungry, and use the former only when needed, Intel technology strategist Bob Crepps told an IDF briefing. He outlined three other techniques:

Body bias – this varies the voltage of the transistor substrate to reduce leakage, or spurious current flow, when it is not being used but allow faster but leakier operation when it is active.

Stack effect – this, paradoxically, uses two transistors instead of one to reduce power. Two light switches in series operate like one if operated at the same time; so will two transistor switches, except their resistance doubles up in the off state, reducing the leakage current.

Sleep transistors – these act like master switches, turning off entire sections of the processor or memory when not required.

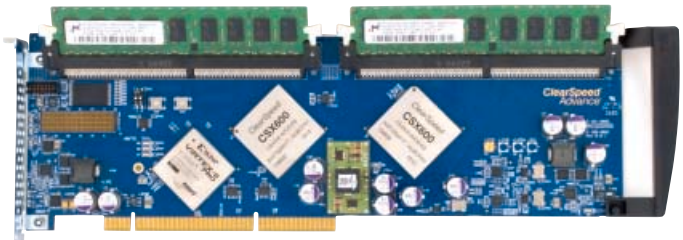
A final technique with wider consequences is to have circuits optimised for certain applications. This trend parallels multicore: rather than (or in addition to) packing several general-purpose processors into a chip, you surround the core with modules hardwired to do a particular set of tasks very efficiently. The CSX600 (see opposite) uses a similar principle.

Rugged PC for hot climates

BILL Su, of Intel's channel-platforms group, shows a 'community PC' designed for emerging markets such as India. The machine would be equipped for Wifi or Wimax to give entire communities access to the web, and would be capable of running off a car battery in the event of a power failure.

Filters are used to keep out dust and insects that might clog up the works and the PC is designed to work in hot climates.

Brit chip fits the bill



Clearspeed's co-processor board beat all comers in speed and power usage

The most impressive device at the Intel Developer Forum (IDF) in San Francisco in terms of speed and power consumption was a co-processor board from UK company Clearspeed. It has been rated at 50 billion floating point operations per second (50Gflops) while drawing a maximum 25w of power – the consumption of a frugal notebook.

The Advance board reached just over half that speed in an IDF demonstration, but that was still more than five times as fast as a comparison system running twin 3.2GHz Xeons.

It uses two Clearspeed CSX600 co-processors, the latest version of the CS301 superchip the company launched in late 2003 (see *PCW*, January 2004, page 19).

Like the brilliant but ill-fated Inmos Transputer in the 1980s, which some of the Clearspeed team helped develop, CSX600 chips are designed to be linked in arrays to boost power. Multiple Advance boards can also be used in a single system.

The CSX600 itself contains an array of 96 processing units, which are computers in themselves, co-ordinated by a control and execution module – an architecture not unlike that of the Cell chip developed by Sony, Toshiba and Motorola, though that has just eight satellite processing units.

Clearspeed stresses that the CSX800 processing units are much more than simple arithmetic logic units. They use a Very Long Instruction Word (VLIW) instruction set, in a similar way to Transmeta's Crusoe chips.

Sadly, the chips work only with software that knows how to take advantage of them. They accelerate the execution of certain operations implemented in standard code libraries used to build applications, and are designed to be used in workstations doing intensive tasks such as weather and finance forecasts, risk modelling and image processing.

The current board needs a PCI-X slot but a PCI Express version will be launched early next year.

PCIe bus to double speed

The PCI Express bus will be upgraded to double the data rate within two years, Intel claims.

The PCI Express ll (PCIe II) bus will be backward compatible with PCI Express devices but will be capable of performing up to 5GT/sec.

Throughput of these buses is measured in gigatransfers per second because the bit transfer rate depends on the number of channels. Thus a 16-channel PCI Express bus has the same GT rate as a one-channel, but can pass 16 times as much data.

A single PCI Express channel can pass 2.5Gbits/sec in each direction under the current standard.

The PCI Express ll bus will always start in PCI Express I mode for the benefit of older cards and negotiate with newer cards to allow a high speed.

Hardware or software will be able to limit the maximum speed, either to save power or to keep pace with other processing events.

ANALYSIS

Office file formats get major revamp

Improvements to Microsoft's doc, xls and ppt formats may not persuade users to buy expensive Office upgrades – and will open the company to more competition. Clive Akass reports

Microsoft executives may rank low on your sympathy chart, but spare a thought for those charged with the task of flogging the next version of Office. The current version is replete with features that few people use, and it is also very good. So how on earth will the company persuade people to buy an expensive upgrade?

Darren Strange, enterprise marketing manager of Microsoft UK's information worker business group, is already on the case, even though the product is not set to launch until late next year, at much the same time as Windows Vista (see page 112). But he is dealing with big enterprise customers who may have a pressing need for the new features.

These features include ways of facilitating online collaboration and other complex tasks, and improved document-management facilities. But the biggest change is a revamp of the basic file formats used by almost all computer users.

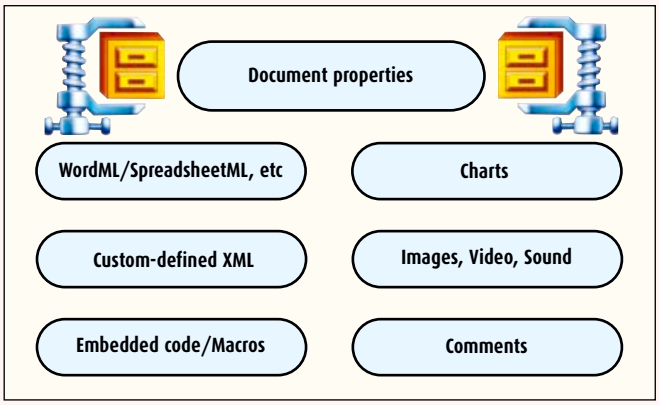
The new Office 12 (a working title that may change for the launch) has been completely re-architected around default file formats based on Extensible Markup Language (XML). You can already save Word documents as pure XML, but the new formats are a little more involved (see diagram, right).

Strange says the move will make it easier and more efficient for programs to exchange information. XML includes data descriptions: a name and address in text is simply a set of words; in XML, each item can be tagged with a descriptor that can be understood and used by a variety of applications. You can tailor tags for your own purposes.

There will be free tools to enable 2000, XP and 2003 versions of Office to save and open files in the new formats, but the old ones are not going to go away. Many organisations still use a mix of pre-2000 and newer versions and may see an upgrade as a hassle they can do without.

The fact that XML makes Office files a lot more accessible could also be a problem for Microsoft. If you open an XML file in an XML editor you can understand the structure quite easily, especially if you are familiar with related HTML. There is an obvious relationship between each element of the file and what you see on screen, which is more than you can say of a .doc file.

This should facilitate tasks such as recovering corrupted files or getting rid of formatting that refuses to die. But it will also help developers create rival compatible applications. Strange is not concerned by the prospect. 'Microsoft welcomes competition. We are confident that we can stay ahead of it,' he said.



The new Office format is not absolutely straightforward, because it consists of a set of modules compressed into a Zip file, as shown in this diagram. But Microsoft says the contents can be accessed easily by using standard unzipping tools. Macros and other code is separated from their associated files, which improves clarity and facilitates security measures. The Zip 'container' also holds any associated images, charts, comments and custom 'schemas' that define XML tags specific to the document.

There will be XML formats for Word, Excel and Powerpoint, distinguished by an 'x' added to the old three-letter suffix: docx; .xlsx, or pptx. Respective macro-enabled versions will be suffixed .docm, xlsm, and pptm.

ANALYSIS

Wordperfect Mail arrives 20 years late

Corel has launched an email client called Wordperfect Mail in a bid to tempt users away from Microsoft Outlook. The new utility, based on the Bloomba package from Stata Labs, includes features to enable you to import contacts and other information from Outlook and Eudora.

Richard Carriere, general manager for office productivity at Corel, said Wordperfect Mail, which has spam protection and a 'very fast' search facility, establishes Wordperfect Office suite as the only truly viable alternative to Microsoft Office.

Long-time users might feel that the launch comes 20 years too late. Wordperfect became the leading word-processing package in the mid-1980s partly because it supported just about every printer at a time when each application had to supply its own drivers.

It had hundreds of drivers for printers but not a single one for a modem, although most models obeyed the same Hayes command set. Email facilities were, as a result, a glaring omission from the remarkable early Wordperfect Office suite, which ran an otherwise full range of standard office applications within just 640KB of Ram.

The first feature of any length I wrote for *PCW* was a description of how to trick Wordperfect into emailing documents via a third-party comms package, but by that time, in the late 1980s, it was already becoming overshadowed by Word.

However, Word has never matched Wordperfect's Reveal Codes feature, which allows direct editing of formats and would be a doddle to implement with Microsoft's new XML files (see above). It will be interesting to see if Office 12 does so – also about 20 years late. *CA*

Toshiba Storage, the beautiful name

We carry out vast amounts of research. We work tirelessly to provide the best products while leaving no stone unturned in our quest to be the best. So it's no surprise our storage devices are selected by the leading PC, notebook and consumer electronics manufacturers in the world. If you'd like to know more about our range of world-class products then visit us at

www.toshiba-europe.com/storage

And who knows, you may find yourself at the FIFA 2006 World Cup! More information can be found in our limited football edition DVD-writer retail kits or online.

TOSHIBA
Official IT Partner

TOSHIBA

Storage Device Division www.toshiba-europe.com/storage

YOUR NETWORK IS UNDER ATTACK

Mr Congestion
the father-in-law

Miss E-mail Moore
the sister-in-law

The Hacker
the brother-in-law

The Mother-in-law
the internet abuser

Mr Virus
Uncle Fester

Prodigy - The Next Generation

Visit www.GSEC1.com or call **0870 164 4010**

A little family of intrusions that spell doom for your computer network

Hackers, congestion, viruses, internet and e-mail abuse. With all of the problems that you and your computer network face today, you've probably purchased a number of different software packages and appliances to protect your data. Prodigy is the first Internet Security Management device to truly unify the fundamental elements of your security policy into a single device, offering your network a high level of security and guarantees peace of mind.

GSEC1® SECURE NETWORKS

Every activated Prodigy comes with Indemnified Data Protection.
Backed by Lloyds of London, IDP gives you total insurance – & total reassurance that Prodigy works.

THE PRODIGY RANGE STARTS
FROM ONLY £365+VAT

Please note this does not include the cost of installation.

GLOBAL SECURITY ONE, WILL PROVIDE A FREE SECURITY HEALTH-CHECK FOR THE FIRST 100 READERS OF PCW*

FOR DETAILS CALL 0870 164 4010 OR EMAIL PCW@GSEC1.COM

UNIFIED SECURITY - EVERYTHING ELSE IS JUST A FIREWALL

*SUBJECT TO TERMS & CONDITIONS, AVAILABLE UPON REQUEST

AVAILABLE FOR THE FIRST 100 READERS

The best in the business – voted by you

The time has come again to vote for your top products and manufacturers from the past 12 months, as we search for the best of the best in the 2005 PCW Awards for Excellence.

The Awards celebrate the innovation and inventiveness of firms in our sector, as they push the boundaries in terms of new products, performance, importance and price. It looks at those that have achieved the highest standards in their particular sector and worked hardest to ensure customers get great products or services at good value prices.

The categories are listed below and, like last year, it will be a combination of your votes and the views of our panel of experts that decides who wins these coveted awards. And again like last year, we have lined up some great prizes for you to win as a thank-you for taking the time and effort to rate your favourites and vote for them. Voting will take place exclusively online at www.pcw.co.uk/awards.

For each of the reader-voted awards, you should judge your winner against their level of service, the quality of their product, its performance, its ease of use and setup and its value for money. Ultimately, would you recommend it to a friend, colleague or member of your family? If you would not, then it does not deserve your vote.

Your votes should be in by 7 November and we will announce the winners in the February issue.

Voting criteria

How you should judge your choices:

- level and quality of service
- product or service quality
- performance
- ease of setup and use
- value for money

See below for more guidance about how to reach your decision.

VOTE ONLINE AT www.pcw.co.uk/awards

The award categories

Voted for by readers

Readers' Choice: PC manufacturer
The manufacturer you rate highest in terms of product stability, performance, customer service and value for money.

Readers' Choice: Laptop manufacturer
The manufacturer you believe offers the best product stability, performance, customer service and value for money.

Readers' Choice: Broadband ISP
Consider the customer service, quality of the service, whether you have had high up-time availability, the speed and price.

Readers' Choice: Office software
For the office productivity software, look at its ease of use, range of features and functions, its reliability, stability and price.

Readers' Choice: Photo-imaging software
Look at the ease of installation and use, range of features and price.

Readers' Choice: Music download site
Look at the ease of use, size of choice available, price and flexibility once you have downloaded your tracks.

Readers' Choice: Anti-virus software
Consider how well your package protected you, the updates and value for money. Also, how did scans affect your PC's performance?

Readers' Choice: Firewall software
Has your firewall kept you safe, do you get regular updates and is it good value for money?

Readers' Choice: Anti-spyware software
The package that has protected you, been good value for money with regular updates and little performance impact on your system.

Readers' Choice: Anti-spam software
Has it kept spam at bay, been value for money and is easy to use?

Decided by the PCW panel

Technology breakthrough
The most innovative breakthrough to influence buying habits. It will look at the technology, its impact and value for money.

Digital camera
The best photo performance, ease of use, picture quality and price.

Networking product
The product that's done most to make networking easy for home users.

Digital home product
Convergence means products that were considered tech toys are now must-have devices in the home, and we are looking for the best.

Graphics card
The performance, cost and stability plus their features and games bundles.

Motherboard
The motherboard with the best performance, features and cost.

Processor
The processor that has made the most impact and has the potential to have a big impact in the future.

Monitor
The best combination of screen clarity and performance, user friendliness and how easy it is to adjust for the perfect settings.

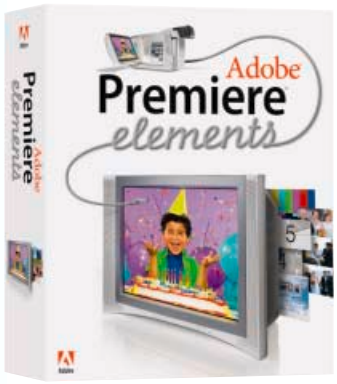
Printer
The best printer, judged by image quality, performance and price.

Utility software
The best packages based on usefulness, usability and price.

Digital video software
Judged on ease of installation and use, range of features and price.

Game
The game that stretched our skills, with the best graphics and storyline.

Fantastic prizes to be won!



We have lined up some fantastic prizes and any reader who votes will automatically be entered into the draw. So vote online for your chance to win!

First prize: Mesh PC & broadband

A Mesh Matrix Prestige Plus PC worth £999. This comes with an AMD 4000+ Athlon 64, 1GB of DDR 400 memory, a 300GB Sata hard drive, an ATI Radeon X800 graphics card, a 19in flat-screen monitor and 5.1 surround-sound speakers.

If you live in an area where you can get broadband and are not locked into a current contract, as a bonus we will also offer the winner a year's free broadband from Pipex, worth £14.99 a month. This is a 2Mbits/sec service with a 1GB download limit, plus the option of 500 minutes inclusive telephone calls.

And that's not all; you'll also get a copy of Adobe Premiere Elements worth £69, one of the best video-editing packages on the market. In total, this great prize is worth over £1,080!

→ **www.meshcomputers.com**
www.pipex.net
www.adobe.co.uk

Plus

- **One free 12-month broadband subscription for Nildram Broadband2go**

Worth £15.99 per month, this is a 2Mbits/sec service with a 1GB monthly transfer limit.

→ **www.nildram.net**

- **Ten Panasonic C10 network webcams**

Help protect your home or business with a network webcam. You can pan and tilt the lens remotely and set it up to email you automatically should it detect movement.

- **Four copies of Adobe Premiere Elements**

This is Adobe's video-editing software, offering a wealth of features for any reader who wants to give their home video a professional look.

→ **www.adobe.co.uk**

- **Ten Fujifilm 512MB flash memory cards**

Megapixels are on the increase, but these cards will give you plenty of room to hold your digital photos, or music files in your PDAs or smartphone. Each winner can choose between Compact Flash, Secure Digital, Multimedia Card, XD Picture Card or Memory Stick.

→ **www.fujifilm.co.ukw**

- **Ten Personal Computer World remote control cars**

Specially made for *PCW*, these Audi TTs are great fun to whizz around your home or office.

Terms and conditions

Readers must vote in at least two categories but do not need to vote in every category. You may not vote for any company that employs you or with which you have a professional relationship. Vendors may not vote for themselves. Entries without contact information will not be entered into the prize draw. Votes must be in by 7 November 2005.

Breaking of any of the terms and conditions will result in your vote being considered null and void.

The Editor's decision is final. No cash alternatives available.

While we will do our utmost to ensure prizes are as described, *PCW* and parent company VNU cannot guarantee prizes will not change, or be held responsible should this be the case. Once prizes have been announced, your name and contact details will be passed to the manufacturer, which will then arrange delivery.

Broadband packages are subject to availability in the winners' areas, plus usual terms and conditions that are applied by Pipex and Nildram.

INTERACTIVE

IN THIS SECTION

30 LETTERS
32 THE ADVISER
OPINION
35 Gordon Laing
36 Guy Kewney
37 Barry Fox

LETTERS

Send your letters to The Editor, *PCW*, VNU Business Publications, 32-34 Broadwick Street, London, W1A 2HG.

Send your email to letters@pcw.co.uk

LETTER OF THE MONTH

The speed of obsolescence

THIRTY months ago I bought a new PC. It was the first all-new PC I had bought in almost 10 years, as I had always preferred to upgrade components a bit at a time until eventually all that was left of the original PC was the floppy drive! Those upgrades had always been driven by the perception that my PC was 'out of date', didn't have the current processor and therefore wouldn't run the software I wanted. But all I have done to my trusty Advent is added some memory and upgraded the video card. The 3.06GHz Pentium 4 processor still runs the software I want it to run and, from the looks of current advertising, is no slouch in any case.

The rush for up-to-date technology has shifted – it's no longer the PC but the gadgets we attach to them that are moving fast technogically. I compared the results of my one-year-old Epson printer with those of my brother's one-month-old Epson printer and the improvement was amazing.

Since I bought my PC, I have owned three digital cameras – two Fujis and my current Canon. I switched to digital from my trusty SLR, excited by the prospect and I have not been disappointed. I can do more with digital than I ever did with film and I now take hundreds of photos, knowing that the cost of storage is minimal compared with the cost of processing similar numbers of 'real' photos. I stopped to think the other day, though – before going digital I had owned three traditional SLR cameras in 26 years! The last one was bought the month my daughter was born – and she's 18 now. My current Canon digital is an SLR – I wonder if that will last me 18 years? Somehow I doubt it.

Jim Brookbank

WHERE IS THE INNOVATION?

I look forward to receiving *PCW* each month and especially enjoy reading the reviews. I have always wondered why the fax/telephone was never marketed as a 'must have' for every home. It was typical of the lack of imagination in many technology-driven companies.

If every home had had one, instead of merely a telephone, not only would costs (and prices) have plummeted but the communication benefits to consumers would have been enormous. Sending letters direct overnight would have been the norm – first-class post would have been almost eliminated.

Recently I have noticed that projectors are beginning to be marketed for home use but this doesn't seem very widespread and having to link the projector to a computer or TV makes life unnecessarily complicated. Again, a lack of customer-driven thinking by technology-driven companies. When will one of them add the simple circuits required for TV reception into the projector? Do that and they could capture the home TV market from LCD TVs and at a low price give us all the benefits of large-screen viewing.

Come on manufacturers, let's have some useful innovation!

Peter Williams

WAP IS GROWING UP

How about running some pages on what is now available on mobile phones using Wap?

Wap did originally seem to be pretty rubbish (ringtones for kids but not much else) but now there seems to be a growing amount of really useful information that can be read on the newer mobile phones.

The BBC runs an excellent Wap site: news, sport, weather, road delays and so on. Yahoo now offers an alternative news service and lets you find items such as the cheapest Nikon camera. And the National Rail site is brilliant: I was able to work out how to get home from the north of England avoiding London; train times and connection delays were all available from my carriage seat.

Wap has come a long way

If you could pull this together and give us a listing, that would be a real added service.

Ian Macpherson

TFT STANDARDS NEED TO IMPROVE

I was astounded by the letter 'Pixel disappointment' (*PCW*, October 2005). I have worked in IT for almost 20 years but for various reasons have had almost no experience with TFT screens.

However, I cannot believe a manufacturer can hide behind a wording to avoid replacing what is basically a faulty product. The purpose of a monitor is to

↘ Unless otherwise stated, letters sent to the Editor, PCW team or contributors will be considered for publication. Letters may be edited for clarity or length.

accurately display images that the PC sends to it. If it cannot do so, it is faulty irrespective of whether it is being used for personal or professional use.

I am more concerned, however, with your acceptance of the 'standards'. Surely this is the sort of thing your magazine should be pushing to improve.
Terry Murphy

Kelvyn Taylor replies: We would dearly love all TFT monitors to have zero defects but would users be willing to pay much higher prices for them? Changing the standard so that it becomes technically or economically impossible for manufacturers to achieve does not really help anyone: defects are inherent in the manufacturing process and no standard can make them go away. For all its flaws, the current standard is much better than the 'wild west' situation that prevailed before its introduction. Having said that, perhaps it is time for the ISO organisation to update the standard to make it more comprehensible to mere mortals, and take into account the increase in average size and resolution of screens compared with four years ago when the standard was last updated.

ADAWARE UNAWARE

How about an article on the data mining cookies which keep on infesting us? Thanks to Adaware, I can clear them out, but 2o7, imrworld and so on keep coming back every few minutes.

It would be good to know how they arrive. Do they piggy-back from sites I visit? How can they report back to base on what I am doing? Why can't a program simply block them instead of clearing them out when they have come?
Colin Day

Kelvyn Taylor replies: Many of these types of cookie are used by websites in order to analyse traffic to their sites. 2o7 is one such example, used by Omniture as part of its web analytics package. Most legitimate companies installing these cookies have an opt-out procedure – for example, Omniture's can be found at www.omniture.com/s2/privacy_policy.html#cookies. The easiest way to stop cookies is to block them permanently in your browser – for IE, choose Tools/Internet Options/Privacy then choose the Advanced button. Click on the 'Override automatic cookie handling' box, then set both options to 'Block'. However, this could have other effects on your browsing, especially if you have used cookies to allow automatic login to some websites.

HELP THE THIRD AGE

Regarding C Jarvis' letter 'IT help for the elderly?' (*PCW*, October 2005), a group I recently came across is the University of the Third Age (www.u3a.org.uk). It has 560 groups across the UK which run self-help groups in a variety of subject areas, including computing.
Keith Parnell

A LOAD OF TOSHIBA

Your mention in the September issue of the Toshiba T1100 reminds me that I still have my T3200, a more powerful luggable of similar age, if I recall. I fire it up about once a year and it still works perfectly, though I have to put in a date from the 1900s! It was updated to Dos 5 before its replacement and it has a wonderful package called Magellan which was a huge improvement on Microsoft's attempt at finding your way around the hard drive – even if there was only 20MB of it. I simply cannot bring myself to bin it.
Tim Boddington

Kelvyn Taylor replies: I certainly remember the T3200, with its 8MHz 80286 CPU and orange plasma screen, as it was one of the first notebooks I ever used, and the one on which I played my first graphical PC game, Accolade's Grand Prix Circuit! Anyone else nostalgic about it can find a few pictures at www.kiwigeek.com/hjp/comps/Toshiba_T3200.

BLUETOOTH BLUES

To follow on from Barry Fox's column (*PCW*, October 2005), it seems to me that, although Bluetooth was developed as a cheap wireless data transfer solution, its only real 'benefit' so far has been for wireless headsets for mobile phones.

This might be a bit hard for those who drive around wearing *Star Trek*-style earpieces to take, but are you ever really that far away from your phone? It certainly is better and cheaper at transferring amusing pictures of the weekend to friends than MMS, but for how long will people want to endure 150Kbits/sec data transfers, when high-speed Wifi is already incorporated into devices as small as PDAs?

Bluetooth: is it really necessary?

Are we again going to see manufacturers choosing to implement a Bluetooth solution rather than a Wifi solution purely because of the cost? A wired microphone with the quality of a £50 Bluetooth headset costs £3 and a mobile phone with Bluetooth costs £300. Vendors seem to either end up using advanced technology where none is needed and not using enough when the application is crying out for it.
Mark Forster

Kelvyn Taylor replies: Bluetooth is still preferred by phone manufacturers due to its very low power requirements, allowing much longer battery life than Wifi-equipped devices.

WIN The letter of the month will win a Trust Bluetooth Wireless Tablet BT446

With a stylish and ergonomic design, the tablet can be used for activities such as drawing, sketching, picture editing and handwriting. The tablet connects via Bluetooth (adapter not included), so you won't have any trailing wires getting in the way.

You can find out more about the Bluetooth Wireless Tablet and other Trust products at www.trust.com or by calling 0845 609 0036.

CLARIFICATIONS & AMPLIFICATIONS

- We have withdrawn the Editor's Choice award for the Acer Aspire 3022 (Sub-£600 notebooks, Oct 2005) as it has been discontinued. Acer has offered its sincere apologies to readers for breaching the terms of entry, which require models to be available for the entire on-sale period of the issue in which they appear.
- The preview of the HP NX6125 notebook in the October budget notebook group test stated a RRP of £599. It should have been made clear this was HP's early estimate, and it has informed us the price is now £645 inc VAT.
- In the October Hands On Digital imaging and video column, screenshot 5 should have been accompanied by an 'after' shot showing the effect of a filter. The photo printed was the unfiltered shot.
- In the review of the Dell 1600n multifunction printer (September 2005), we incorrectly stated that it doesn't support network scanning.

THE ADVISER

PCW GIVES ADVICE ON YOUR RIGHTS

→ **Send details of your dispute to theadviser@pcw.co.uk.** Please provide a daytime telephone number so we can contact you if necessary.

COVER YOURSELF

- Keep good records; storing all receipts in one safe place as proof of purchase is vital.
- Create a folder in your email client to store emailed receipts – but print a copy too. Print spec sheets from websites as proof of what you ordered.
- Get written quotes from shops specifying components to be used.
- Use a credit card if possible for purchases of £100 or more – credit companies are liable if the company goes out of business.
- Do not try to repair faults yourself – this invalidates your rights in the majority of cases.
- Think carefully before buying expensive hardware outside the EU, because if something goes wrong, enforcing your rights is very difficult. Shipping a faulty product back will also be costly.
- Never cancel a direct debit or standing order as a means to resolve a dispute over payments or service. You may get a poor credit rating and face court action.

HOW TO COMPLAIN

- Keep records of who you speak to, along with any paperwork and emails.
- Stay calm – companies will respond defensively to abuse, shouting or swearing, regardless of whether you are in the right.
- If the dispute reaches an impasse, insist on escalating the complaint. Get the name of a director and send correspondence by recorded delivery.

FAILURE TO REPAIR

I bought a laptop in November 2003 and it failed after four months. A new motherboard kept it going for a further four months, after which another motherboard was required. These were both warranty repairs but seven months later I had another failure with the same symptoms, outside warranty. I returned the goods to the seller for a non-chargeable repair. I heard nothing for about three months and then an email arrived saying that 'no fault had been found'. A few days later the broken PC was returned to me.

My attempts to get anywhere with the credit card company got very short shrift. I felt my only option was to take the seller and credit card company to the Small Claims Court. Before resorting to this, I contacted the chief executive of the manufacturer and a compromise 12-month warranty including repair of the computer was agreed, at a cost of more than £80.

Arthur Edards

The sad truth is that a minority of companies gamble that consumers will not enforce their rights, either through ignorance or in the belief that the case is not worth the effort. When claims are brought, courts take into account which of the parties has made the most reasonable effort to resolve a dispute.

We do not have the full details of this case, but if a PC is returned for repair, holding it for three months is not reasonable, especially with no contact.

Mr Edards could have claimed a replacement or partial refund following the failure of the second repair, but after that length of time the onus would be on him to prove the motherboard was faulty.

The scales of justice in the Small Claims Court are finely balanced

He should have insisted the company return the PC sooner, then sought an independent report on why the PC was faulty. In court, if he could prove the replacement motherboard caused a subsequent fault, it should not matter that the manufacturer's warranty had expired.

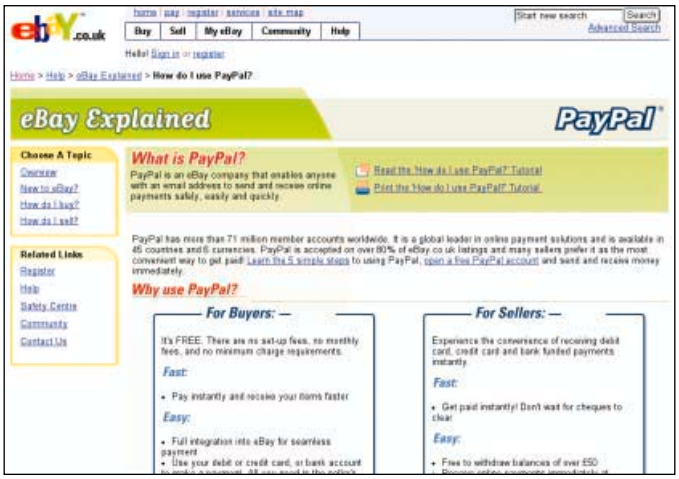
It could be argued that such a central component should be expected to last longer than seven months. In that instance, legal action against the seller, rather than the credit provider, would have been the most reasonable course. We must stress that the report could be contested and that good records of attempts to resolve the dispute would be crucial.

It is the responsibility of sellers, not manufacturers, to deal with consumer complaints because the contract of sale under the Sale of Goods Act is between the consumer and the company that accepts their payment. In some cases, the manufacturer may offer help and, if you reach such an impasse as Mr Edards, it is worth trying. Some companies will say that you must arrange for repairs with manufacturers directly, as this is 'company policy'. No 'policies' can make a UK company exempt from the law, so do not be fobbed off by this.

OVERSEAS NIGHTMARE

I sold some goods on Ebay to a buyer in Israel and contacted him to arrange international delivery. He declined to pay for a courier service such as UPS or DHL as the cost was £96 and suggested I get a price for sending by Royal Mail.

The price quoted was £46 for standard seven- to 10-day delivery, but this included no means to track the parcel. My buyer was unhappy about this, but when I offered to cancel the



Paypal originally sided with the buyer, but agreed to review Mr Cooper's case

delivery and the sale, he agreed to take his chances.

The item did not arrive and the buyer made a complaint to Paypal, through which payment was made. Paypal gave me three options: provide proof the item had been received, a tracking number or confirm a full refund had been given.

When I called Paypal to explain why none of these options was possible, the company asked me to email a summary and fax supporting documents to it. I sent a Post Office receipt and a transcript of the MSN Messenger conversation I had with the buyer showing his instructions.

Weeks later, Paypal emailed to say it had found in favour of the buyer and debited my Paypal account by the value of the item.
John Cooper

Sending items, particularly overseas, without tracking is fraught with perils. Online auctions let you set conditions for delivery, and you should specify that overseas orders will only be sent via some form of recorded delivery. If buyers refuse to pay the premium for tracked deliveries, Ebay users are within their rights to cancel an auction and this process will be easier if such a condition is listed in the item description.

In this case the buyer was clearly accepting some risk for the item's safety, so we asked Paypal to review the case. It has agreed, as a one-off, to reimburse Mr Cooper as Paypal was slow to respond to his complaints and resolve this problem.

What now for Tiny customers?

I recently ordered a PC from Tiny.com. It was a present for my sister and, as she lives at the other end of the country from me, I also paid for an extended warranty to cover her for issues I couldn't fix over the phone. The PC arrived on the day news broke that Tiny's parent company had gone into liquidation. The problem is that the supplied set of surround-sound speakers doesn't work properly.
Oliver Nash

Time is up for Tiny.com

This is just one of a number of emails we have received following the demise of Granville Technology Group, the company behind three of the industry's biggest brands: Time Computers, Tiny.com and The Computer Shop. Accountancy firm Grant Thornton has been appointed administrator and has set up an enquiry line on 0870 830 3288 and an email address at enquiries-time@gtuk.com.

If you have placed an order and not received goods, call as soon as possible, providing details of order numbers. Those who paid using credit cards should notify their card provider, as they could get a refund if the order was worth £100 or more. This does not apply to debit card orders.

Grant Thornton will try to meet as many commitments as possible, although, with Granville's debts thought to be around £30m, some will end up empty-handed. The 1,500 employees will probably be first in line and the HSBC bank is thought to be owed more than £19m. Consumers could end up at the end of a very long line.

Grant Thornton has promised a limited warranty service, but details are yet to be released. When Granville purchased the Tiny brand (after it had first gone into liquidation) the company told *PCW* that insurance had been taken out to protect holders of extended warranties. If extended warranty contracts are taken on by another company it could even ask for an extra payment to safeguard the warranty, as happened previously when Tiny went out of business.

If you have sent products back to any Granville company for repair, remember they are your property. Contact the administrator with full details of your returns number. If you have bought a product from Time or Tiny that has a minor problem, cut your losses. For major problems, contact the administrator and read *PCW* for updates.

CONTACT THE ADVISER

If you're involved in a serious dispute with a seller, send us a brief description of your complaint, name the company involved and provide an order number or other information that we can use to identify your order with the company. We cannot guarantee to resolve your dispute but we will try. We obviously cannot take on every case, but the answers we give should help readers to resolve their own disputes.

You can also get advice from Consumer Direct, a DTI-backed agency, on 0845 04 05 06.

KNOW YOUR RIGHTS

- **In England and Wales, it is up to the retailer to prove that faults found within six months of purchase are not inherent.**
- **Consumers should not suffer financial loss in order to repair a faulty item, so postage and courier fees should be claimed back if the fault is inherent.**
- **Companies are not obliged to repair goods damaged by accident or misuse.**
- **The contract of sale is between the buyer and the company that accepted your money. It can be quicker to deal direct with manufacturers, but do not let resellers bully you into this.**
- **Goods ordered online, by post or by phone can be returned under the Distance Selling Regulations within a reasonable time. This is widely accepted as being seven days.**
- **Companies cannot charge for services they fail to deliver, regardless of any contract you have signed – the contract goes both ways.**
- **Benefits provided under extended warranties are an addition to your statutory rights, so agreeing to buy one does not mean you cannot enforce consumer rights under legislation.**
- **Online auction sellers are only obliged to ensure goods are described accurately. However, individuals selling more than one of an item, and those listed as power sellers, may be classed as businesses rather than individuals.**
- **For more detailed information on consumer law in England and Wales, visit www.oft.gov.uk/consumer. In Scotland, visit www.scotscourt.gov.uk.**

Flip2disk

> Pocket sized portable hard drive with multiple connectivity

> Supplied with USB2, FlipBack disaster recovery software, stylish carry case and Shoc Bloc protection for increased robustness

> Capacities of up to 100GB, no mains power required

Prices from **£98** ex VAT (40GB)

IOdisk

> Pocket sized hard drive with integrated USB2 interface

> No mains power required

> Supplied with stylish carry case

> Capacities of up to 100GB

Prices from **£67** ex VAT (40GB)

Encryp2disk 2.5”

> The most secure external portable hard drive available with hardware encryption

> Supplied with integrated USB2 and two secure keys that contain and protect the encrypted password

> Capacities of up to 100GB and up to 192Bit hardware encryption

Prices from **£95** ex VAT (40GB)

Encryp2disk 3.5”

> The most secure external portable hard drive available with hardware encryption

> Supplied with integrated USB2 and two secure keys that contain and protect the encrypted password

> Capacities of up to 400GB and up to 192Bit hardware encryption

Prices from **£97** ex VAT (80GB)

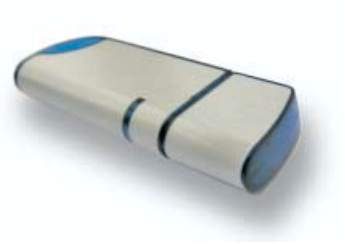
USB2 External Desktop HDD

> External desktop hard drive with USB2

> Capacities of up to 400GB

> Robust aluminium enclosure provides excellent heat dissipation and shock absorbency

Prices from **£59** ex VAT (80GB)



USB2 Flash Key Drive

> Simple and quick way to store, share and transport files and folders

> Capacities of up to 2GB

Prices from **£9** ex VAT (128 MB)

16x External +/- DVDRW Double Layer

> Burn up to 8.5GB on one disk

> High-speed recording and integrated USB2 interface

USB2 only **£59** ex VAT

USB2 and Firewire **£79** ex VAT

24x USB2 External Slim-line Combo Drive

> CDRW & DVDROM Combo drive

> Super slim and stylish

> High speed USB2 connection

£71 ex VAT

8x USB2 External Slim-line +/- DVDRW Double Layer Drive

> Double layer support – burn up to 8.5GB on one disk

> Dual format – DVD+R/RW and DVD-R/RW

> Super slim and stylish

> High speed USB2 connection

£99 ex VAT

In addition Amacom is currently offering:

> Free of charge delivery
> Free technical support
> Free extended 12 month warranty

www.amacomdirect.co.uk | Call 020 8993 7373

AMACOM
Innovating Digital Storage

Gordon Laing

gordonl@pcw.co.uk

Why digital SLRs could cause a dust up

Imagine all your holiday snaps being ruined by pesky dust particles. Gordon Laing suggests blowing away the blues

Digital SLRs have grabbed the camera-buying public's imagination. Affordable models, first pioneered by Canon's EOS-300D two years ago, are now available from every major camera manufacturer, and if you shop around you could be the proud owner of one for less than £600.

This is great news for photography enthusiasts, but if you have only just started using a digital SLR camera, prepare yourself for the return of an old photographic nemesis: dust. Believe it or not, dust can – and almost certainly will – enter a digital SLR camera at some point and attach itself to the sensor.

Technically speaking, the dust actually settles on a filter in front of the sensor, but still results in a small dark blob on the image. This is particularly noticeable in areas of blue sky, especially if you zoom in on your computer afterwards – and if dust can be seen on one image, it will almost certainly be there on others. There could be marks on all your treasured holiday or wedding photos.

'The benefit of removable lenses equally presents an opportunity for dust to enter'

So how does this happen? Well, the benefit of removable lenses equally presents an opportunity for dust to enter the body of an SLR. It normally settles innocently enough on the mirror or shutter blades but then becomes airborne during an exposure and, like a falling slice of buttered toast, inevitably lands where you least want it to. Electrostatic charge on the sensor's surface can also attract the particles.

Clearly, the most vulnerable time is when the lens is removed from the camera's body. Fitting the body cap can certainly reduce the number of particles that enter, but watch out because the cap itself might be dusty. Similarly, dust on the rear of lenses can easily make the jump to the sensor.

Digital SLR manufacturers all recognise dust as a problem and offer the same advice: when changing lenses, avoid dusty or windy areas, hold the camera face down and do it as fast as possible. Body and rear lens caps should also be used but kept clean to avoid dropping dust into the body.

If dust does get in, use the camera's sensor cleaning option. This flips open the mirror and shutter, but you should not then physically wipe the surface or even use compressed air as it could leave a residue. Instead, hold the camera face down and blow into it using the body of a blower brush with the brush itself removed. A few good blows should dislodge most pesky dust particles; you can make sure by photographing an area of flat colour such as blue sky afterwards and zooming in on your computer to check the image is dust-free.

As for images already affected by dust marks, they do at least tend to be most visible in areas which are easy to retouch with software cloning tools. Indeed, software seems one way forward in the battle against dust: Nikon's latest Raw file converter can use a reference image taken at the end of a day's shooting to identify and remove dust from previous images in a batch process.

Dust will inevitably remain an issue for digital SLRs in the future and, while some manufacturers such as Olympus have developed ways to physically shake it off, most owners will simply have to be aware of the problem and know how to deal with it. If this all sounds too much like hard work, you may be better off with a sealed all-in-one camera instead.

To be fair, dust has of course plagued photographers since well before digital SLRs, whether in a darkroom or when scanning film. I hate it as much as the next person, but have absolutely no regrets about buying a digital SLR, nor any hesitation in recommending them to others.

Just be aware that dust is an issue and do not forget your blower brush next time you go on holiday. **PCW**

Guy Kewney

guy.kewney@gmail.com

What's on your spy pod?

As podcasting goes mainstream, Guy Kewney predicts that firms will exploit its ability to spy on your listening habits

When the Sunday papers get excited about podcasting, you know it's achieved something. The thing is, the podcasting that the mainstream press is getting so excited about isn't what podcasting is about at all.

What is podcasting? 'It's basically the same thing as recording a radio programme on a cassette,' opined one pundit, 'only easier.' Someone else said: 'No, it's more like a Tivo for audio; it lets you listen when it's convenient for you.' Both statements are true, but neither gets to the core of what podcasting is really about.

Nor is podcasting about digital rights management (DRM), although this technology is an element.

'It will be possible to tell not only what you downloaded, but which bits you looked at'

Podcasting is about spyware.

Over the next year or so, look out for pioneers trying out various ways of making podcasting more controllable. I just downloaded my own favourite podcasters, the Gillmor Gang – 40MB of audio. It takes forever to play and, when you're done, let's just see you try to find the bit that was interesting so you can store it in your pod.

What we need is a way of editing podcasts before we send them out to listeners, so they are able to skip sections. Break it up into tracks; index them, skip forward, back, store – even Beethoven split up his work better than this. And when this kind of editing happens, it gives the marketing industry a handle on our habits.

What people want, if they have something to sell, is the ability to find the person who will buy. To do that, they need to know what people like and dislike. If you could take a radio programme such as *Today* on Radio 4, and see which bits you skipped and which bits you replayed, you'd get a big, fat clue to your personal interests, fears and foibles.

So how can the advertising business find that information?

It's not too hard, in fact. Most of the tools it needs already exist. There was no need for yet another media player when Microsoft produced Windows Media Player 9 and 10; the main technology the company added was DRM. It was supposed to have every record company switching to WMP overnight so they could avoid piracy.

Record companies want to know what music you have listened to, which is what the DRM hooks will be able to tell them. And the same DRM hooks put into podcast material will feed back into the big Google and Yahoo databases. Advertisers will then rent that data, for a fraction of a cent a time, and be able to target their advertising more efficiently.

You may not like to think of it as spyware, but it will be, and what is more, most of us will welcome it as a great way to cut down junk mail and spam. After all, why go to the bother of advertising to 100,000 people when you know only one per cent are even vaguely interested? If you can find that one per cent with precision and economy, that's got to be an advantage.

The same will apply to other 'new media' as they appear. In the next five years, display technologies will start to include epaper – flexible displays with the same resolution and contrast as this magazine. It will become possible to tell not only what you downloaded, but which bits you looked at. Spyware feedback will allow the retail industry to tell you exactly what you want to hear.

Today's podcasts don't do any of that. It may take a while before we all have pod players with the ability to search on indexed data, as well as 'artist' or 'song title' – but very soon after they arrive, the pod with a usage monitor will follow. **PCW**

Barry Fox

barryf@pcw.co.uk

The blind are leading the blind

A simple problem with his new router saw Barry Fox on his own and quickly reaching the end of his networking tether

Visit your nearest PC superstore and see the pile of used networking gear on special offer – most likely returned for refund by people who could not get it to work.

Persuading two PCs to share Internet access while remaining secure is never easy. Add AOL to the equation and it becomes a nightmare. Norton fights with Windows' Firewall. The latest version of Webroot Spysweeper fights Norton and clashes horribly with a proxy server, which is needed to make AOL's proprietary software share Internet access. A Wifi connection has to keep out hackers but not the owner. An Ethernet router won't connect to a USB modem. Using a combined DSL modem and router should do the trick but the instructions are incomprehensible to a novice. Internet bulletin boards are awash with postings from people who can't get their DSL routers working.

'Persuading two PCs to share Internet access while remaining secure is never easy'

I bought a Belkin DSL modem/router, printed out the 80-page manual from the CD-Rom and got it working with Tiscali but not with AOL.

I called Belkin's helpdesk.

'May I call you by your first name?'

'Yes.'

'Well Barry, your AOL user name and password must be wrong.'

'But they work with another modem.'

'Your AOL password has to be eight digits.'

'It is eight digits.'

'You should call AOL but don't tell them you are using a Belkin modem, because if you do they won't help.'

By coincidence, a press release arrived. 'A large percentage of network equipment is returned simply because users are unable to connect to various devices,' said German software company BHV. 'Designed to easily and painlessly deploy, configure and maintain home and small office networks, Home Net Manager solves this problem.'

Home Net Manager insists on online registration, complete with the user's age, before it will install on a PC. On each attempt my registration failed, locking up the PC with a setup.exe error message.

Said BHV: 'The software installs without any problems if started by selecting setup.exe on the CD from Windows Explorer.'

I took the bypass and up came the error message 'Internal Error – Suggest Re-install'.

'The problems Mr Fox had were not common – that's good news,' says BHV.

Good news or not, I wrote off Home Net Manager, bought a Netgear DSL router that AOL specifically recommends and printed out nearly 200 pages of manual. But no amount of setup fiddling would get it working with AOL. Netgear's helpdesk admitted defeat.

I hate writing articles which leave loose ends, so I stuck with it. The magic nugget of truth is that a combined modem/router will only work with AOL if the AOL password is between six and eight characters long, and contains no upper case characters.

This despite the fact that AOL's help page uses the much longer 'youraolpassword' as an example of what to enter.

The trick is to use a working modem to change the email password to a word that fits the magic requirement, and then store it in the modem router. Both the Belkin and Netgear modem routers then work fine.

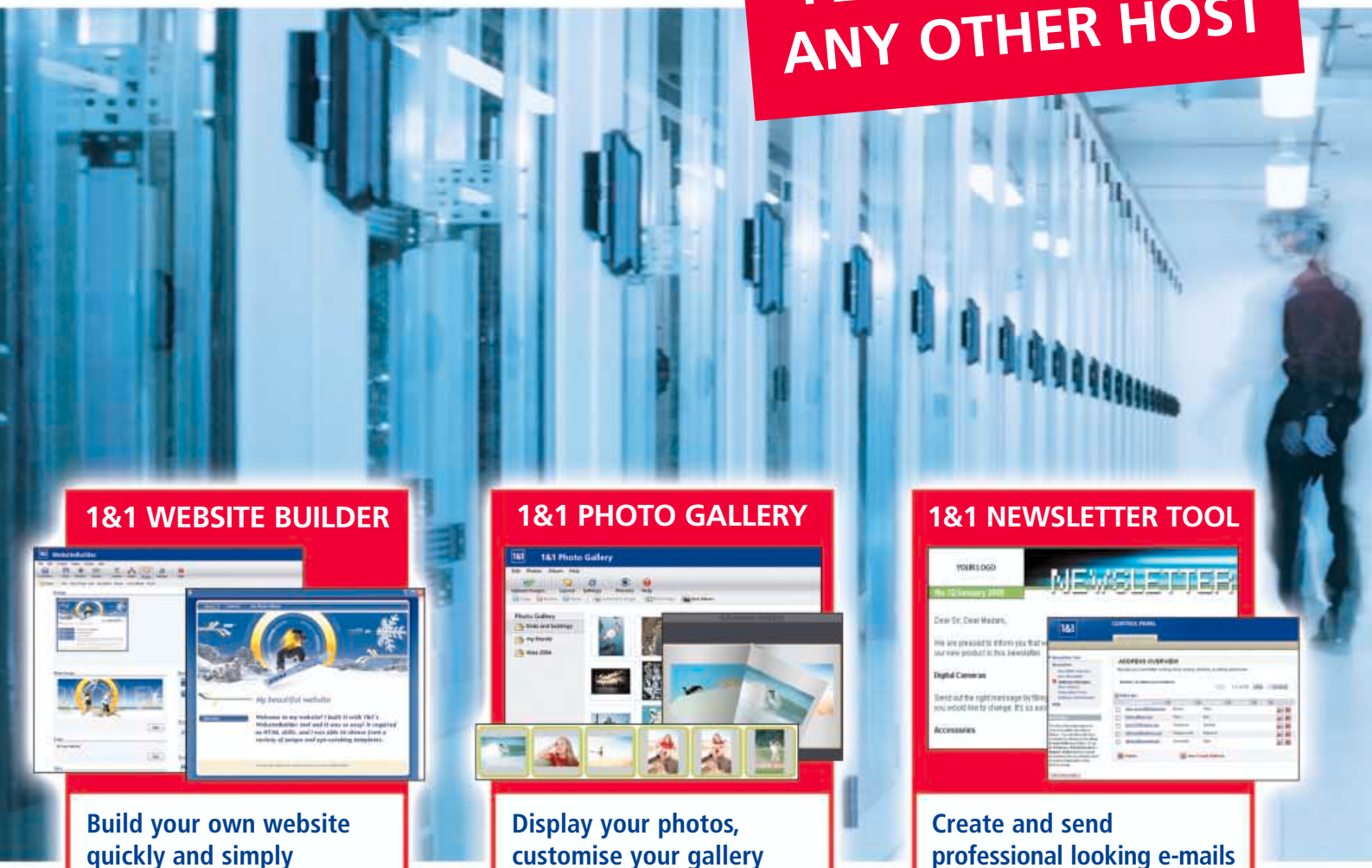
This is the simple advice the Belkin and Netgear helpdesks should be giving. It would save customers misery and save PC superstores the hassle of handling returned goods. I spent more time and money on nailing this than on any other topic I have ever tackled for this column.

So I am deadly serious when I say that if Belkin and Netgear now want to benefit from my wasted time and money, they should add a note to their setup guides and memo their help staff, then make a donation to charity.

I reckon The Guide Dogs for the Blind Association would be an appropriate cause. **PCW**

UNBEATABLE HOSTING FROM 1&1

MORE INCLUSIVE FEATURES THAN ANY OTHER HOST



1&1 WEBSITE BUILDER

Build your own website quickly and simply

1&1 WebsiteBuilder runs from a browser window and lets you build a professional-looking site in minutes, without the need for a professional programmer or web designer. Choose from lots of professionally designed templates, even edit fonts and colours for added personalisation. Preview your pages before publishing and using our page publishing tool you can easily publish your site with no FTP involvement.

1&1 PHOTO GALLERY

Display your photos, customise your gallery

Display your family pictures, client work or whatever photos you like using the 1&1 Photo Gallery. The 1&1 Photo Gallery provides you with a range of gallery templates, offering slide show transitions or a straightforward picture view. You can choose background music for viewing and for security you can password protect your gallery. Your photo gallery will seamlessly integrate with 1&1 WebsiteBuilder.

1&1 NEWSLETTER TOOL

Create and send professional looking e-mails

No programming knowledge needed. Communicate offers, discounts, announcements, invitations and lots more – quickly, easily and cost effectively using predesigned templates to complete that professional look. Build your own mailing list, manage your recipients' addresses and track your newsletter performance. Store previously published newsletters and use our editing tool to work on individual sections.

Member of united internet

08708 503305

UK's No.1 Web Host gives you more for your Money

When hosting your website with 1&1 you get all the tools and features you need to create your website, send e-mail, communicate with your visitors, build contact forms, promote your site in leading search engines, analyse your visitor statistics and much more. Whether you are a complete beginner or running a small business, 1&1 has a package to suit your needs. Plus, for optimum performance we have 18,000 MBit connectivity, the largest in the industry.

IN2SITE LIVE DIALOGUE

Chat with your visitors – live and in real time

Talk to your website visitors live and directly with 1&1 In2Site Dialogue. You receive an optical or acoustic notification as soon as someone visits your website, you can then open a live dialogue box to greet and interact with your visitor. Watch your customers browse around first and interact at the appropriate time. You can also force browser windows into their view in order to point them to certain products or to the right pages.

1&1 WEB STATISTICS

Analyse the performance of your website

Understand your visitor dynamics with 1&1 WebStatistics. Track visits, hits, most popular pages, referring websites, error pages and identify trends to know exactly how your website is performing. Display the information in the format you choose – pie charts, bar graphs or simple numeric output. See whether your website is performing to your expectations and gain intelligence to optimise and maximise its success.

BUSINESS PRO PACKAGES

FROM **£14.99**

INCLUDES 5 FREE.CO.UK DOMAINS

PACKAGE FEATURES		
Web space	6 GB	6 GB
FTP access accounts	75	75
Monthly Traffic included	50 GB	50 GB
1&1 Control Panel	✓	✓
MARKETING TOOLS		
In2Site Live Dialogue	✓	✓
1&1 WebStatistics	✓	✓
1&1 WebElements	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebDatabase	✓	✓
Customisable Forums	✓	✓
WEBSITE BUILDING TOOLS		
1&1 WebsiteBuilder	25 pgs	25 pgs
1&1 Photo Gallery	✓	✓
1&1 DynamicSiteCreator	25 pgs	25 pgs
1&1 Multimedia Archive	✓	✓
Full Version Software worth £400	✓	✓
FrontPage Extensions supported	✓	✓
Ready-to-run CGI library	✓	✓
ASP Scripting supported	–	✓
ASP.NET, .NET Framework	–	✓
PHP3, 4 & 5, Perl & Free CGI's	✓	–
Database	5 MySQL	MS Access, 1 MS SQL
SQL Import	–	✓
SSI (Server Side Includes)	✓	✓
Cron Jobs	✓	–
DOMAIN NAMES		
Included .co.uk domains	5	5
Sub-domains	1,500	1,500
Point external domains to 1&1	200	200
Complete DNS Management	✓	✓
E-MAIL		
IMAP/POP 3 E-Mail accounts	1,500	1,500
Auto-responders/E-Mail aliases	✓	✓
1&1 Webmail	✓	✓
Virus scanning for accounts	20 Acc.	20 Acc.
Spam Filtering	✓	✓
SECURITY FEATURES		
Protected by up-to-date Firewall	✓	✓
Daily backups	✓	✓
Password protection	✓	✓
Shared SSL or optional own SSL Certificate	✓	✓
SSH Access	✓	–
EXPRESS SUPPORT		
Free 24/7 Express Support	✓	✓
Comprehensive FAQ's	✓	✓
Step-by-step online guides	✓	✓
Online account management	✓	✓
No Set-up Fee. Total price per month + VAT.	£14.99	£16.99

1&1 has more to offer:

1&1 MAIL	FROM £0.69 PER MONTH
1&1 DOMAINS	FROM £1.99 PER MONTH
1&1 WEB HOSTING plus free .co.uk's	FROM £4.99 PER MONTH

– Linux packages

– Microsoft packages

1and1.co.uk

1&1

LINKSYS®
A Division of Cisco Systems, Inc.

Setup a Secure Wireless Network in Seconds!

(No experience required)

WAG54GS
Wireless-G ADSL Gateway
with SpeedBooster

125 Signal Rate
*For details see backside of package

Just Push the Button

Want to setup a wireless network and turn on all the security features? Follow these simple instructions:

STEP 1: Push the button on the new Linksys router or gateway with SecureEasySetup™.

STEP 2: Click the button on your computer screen.

STEP 3: There is no step 3. You're already finished. You are now free to surf the Internet from anywhere in the home, check emails, listen to music, or browse digital photos with the latest in wireless security!

Linksys. Nobody makes networking easier!

Visit www.linksys.com/uk today for product details. Freephone Technical Support 0800 026 1418.

amazon.co.uk and you're done. COMET STAPLES that was easy.

Specifications are subject to change without notice. Linksys is a registered trademark or trademark of Cisco Systems, Inc. and/or its affiliates in the EU and certain other countries. Copyright © 2005 Cisco Systems, Inc. All rights reserved.

CISCO SYSTEMS

ELONEX MEDIA CENTER NOTEBOOK
First review on page 42

DUAL-CORE PCS
Seven models tested on page 71

Trusted tests from the UK's best Labs

EDITED BY WILL STAPLEY
will_stapley@vnu.co.uk

REVIEWS

WHAT'S NEW THIS MONTH

Media Center might not have taken off as well as Microsoft would have liked, but that hasn't stopped PC manufacturers from giving it their backing. And it's easy to see why – the interface is well-designed, easy to use and loaded with features. Elonex has put its money behind the Media Center dream with its all-new Mediastar 1541 (see over).

Also reviewed is an SLI PC from Mesh, with two Nvidia Geforce 7800 GT graphics cards, Sony's high-definition camcorder (pictured) and the X-Fi range of soundcards from Creative. Plus there's security software from Zone Labs, Macromedia's Studio 8 web design suite and the database package Filemaker 8.

To help you find your way around *PCW*, we've brought product, game reviews and group tests together. And many write-ups have more pictures, giving you extra views of a product. We also highlight alternative products in the Buyer's Guide that may better fit your needs. Let us know what you think of the new look by emailing us at letters@pcw.co.uk.

CONTENTS

HARDWARE
42 Elonex Mediastar 1541
43 Mesh Matrix Xtreme PCW
46 Dell Optiplex GX620
Rock Hardbook

PERIPHERALS
47 Sony HDR-HC1E
Pentax Optio S5z
48 Creative Soundblaster X-Fi Elite Pro
Orange SPV C550
49 Dell Laser Printer 1100
50 Cellink BTST-9000D
Mio 269
51 Logitech Cordless Desktop S 510 Media Remote
54 APC Wireless Router
54 Maxtor Onetouch II Firewire 800
Hercules Wireless Router
NEC ND-3540A

COMPONENTS
58 MSI 945P Platinum
Storcase Data Express
59 Enermax CS-718 Maxflow
Foxconn 915PL7AE-8EKRS
FSP Zen 300W
PNY Geforce 7800GTX

SOFTWARE
60 Macromedia Studio 8
61 Zone Labs Zone Alarm Internet Security 6
63 Filemaker Pro 8
64 Mythicsoft Remote Command
Webex MywebexPC
65 Google Talk (Beta); Miracle Type; Undelete 5; Ufly4less

GAMES
68 Chrome Specforce
69 Big Mutha Truckers 2
ER

GROUP TESTS
71 Dual-core PCs
85 Anti-spyware packages
94 Network cameras
99 Inkjet photo paper
107 Power over Ethernet switches
111 How we test

OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.

Recommended: A product that combines great features, usability and value for money.

Great Value: Not the best in class, but a product that has superior features and performance for the price.

The business awards are used for products that are more suited to home offices or small businesses.

Editor's Choice

Recommended

Great Value

Editor's Choice Business

Recommended Business

Great Value Business

'The quiet nature of the Dell Optiplex GX620 is its main selling point'

Read the review on page 46

MEDIA CENTER NOTEBOOK

Elonex Mediastar 1541

A portable, stylish entertainment system with a lot of potential

Top: The Mediastar features a memory card reader, DVD burner and a Firewire socket

Bottom: Should the viewing angles cause problems during video playback, the S-video port lets you output to a TV

Elonex isn't afraid to try something new when it comes to Media Center PCs – last month's whopping 40in LCD model is testament to that. Its latest Media Center is slightly more subdued, coming in the form of a 15.4in widescreen notebook.

Most Media Center PCs are designed around desktops, one based on a notebook may seem a little odd. However, it does have its uses. For example, students could use it as a portable computer to take to lectures as well as a fully fledged home entertainment system.

As it is likely to reside mostly in a lounge environment, Elonex has taken time to make the Mediastar attractive. The top of the notebook has a silver corrugated effect, while the dark grey livery on the inside adds a touch of class.

The notebook runs off an Intel Pentium M clocked at 2GHz and is supported by 1GB of DDR 333 Ram. The 80GB hard drive is adequate, but considering this is a Media Center PC you'll probably be looking to store a large amount of storage-hungry video and audio files. Elonex offers a 120GB hard drive for £85 extra. Should you start to run out of space, you can archive files direct to DVD thanks to the inclusion of a two-speed dual-layer burner. A 256MB Radeon X700 card beats integrated graphics hands down, especially when playing games with complex textures, and notched up a decent 3Dmark05 score of 2,401.

Just one analogue tuner sits inside the Mediastar – a dual-tuner setup would have been preferable, allowing you to record two programmes at once or record one channel while watching another. With this setup though, you have to leave it on the correct channel while you're recording a programme.

Elonex supplies a remote control with the Mediastar. It's far smaller than most Media Center remotes, but features all the necessary buttons and there's no need for an external infra-red receiver.

The quality of the screen is obviously important on a Media Center notebook. We've no problems with its size (and the widescreen format was a sensible decision), but the display needs to be brighter. The viewing angles aren't great either – something that could be a problem if you've got a group of people watching the same film. But if it does cause issues, you can always switch to the S-video output and send the signal to a television. If your TV has a Scart socket, you can pick up an S-video-to-Scart converter for around £10.

Audio can also be output either via the coax digital-out or line-out socket. It's something you'll probably want to make use of since, although the stereo speakers and subwoofer sit prominently on the chassis, they're limited in terms of volume.

There's a lot to like about the Mediastar. It's well designed and looks great, while you also benefit from all Microsoft Media Center 2005 has to offer. But it isn't without drawbacks. The inclusion of just a single tuner limits recording features and the fact that it's only an analogue tuner means you won't be able to benefit from Freeview digital broadcasts. If you're desperate for digital TV, you could always purchase an external DVB-T tuner, but it's not the perfect solution.

Despite its limitations, the Mediastar is still a quality Media Center notebook from Elonex. Plus, if you order online with the e-web code 10-PCW-541 you'll get free delivery. *Will Stapley*

Performance

Sysmark 2004 SE: **163**

Mobilemark **2:16 (hours:minutes)**

Details

Price £1,398
Best price www.pcw.co.uk/bestprices
Contact Elonex 0870 780 1010 www.elonex.co.uk
Specifications 2GHz Intel Pentium M • 1GB of Ram • ATI Radeon X700 256MB • 80GB hard disk • Dual-layer DVD-RW • Analogue TV tuner • Remote control • Gigabit Ethernet • 802.11g • Windows Media Center 2005 • 363 x 281 x 30mm (w x d x h) • 3kg • 1yr RTB warranty

Verdict

Pros Good features; well designed
Cons Single analogue tuner; poor speakers

Features ★★★★☆
Performance ★★★★☆
Value for money ★★★☆☆

Overall Single analogue tuner is disappointing, but otherwise it's a quality Media Center notebook

★★★★☆

SLI PC

Mesh Matrix Xtreme PCW

Two Nvidia 7800 GT graphics cards prove their worth

The Musketeer 1 display dials look good, as does the new Cooler Master case

Mesh's Matrix Xtreme PCW uses two of the newly released Geforce 7800 GT graphics cards, slightly cut-down versions of Nvidia's flagship 7800 GTX. Although there's no denying the superior gaming performance of PCs using two graphics cards simultaneously, the almost prohibitive price of such systems makes them enthusiast-only territory.

The 7800 GT has a lot in common with its bigger brother, but a number of concessions have been made to help ensure a lower price. Most notably, the graphics processing unit (GPU) is clocked at 400MHz, 30MHz lower than the GTX, and its 256MB of DDR 3 memory runs at 1GHz instead of 1.2GHz. It also has 20 pixel pipelines instead of 24, and seven vertex units (used when processing 3D polygons) instead of eight. Despite this, the 7800 GT is still very powerful. Mesh harnesses this power by using two of these cards in a Scalable Link Interface (SLI) configuration.

Our benchmarks confirmed the graphics prowess of this PC. In 3Dmark05, it achieved a score of 11,846 (just 427 points shy of Evesham's dual-7800 GTX system reviewed in the October 2005 issue).

This performance was helped in no small part by Mesh's decision to use an Athlon FX-57 processor and 2GB of DDR400 memory. Unlike the PCs reviewed in our dual-core group test on page 71, this single-core CPU is designed specifically for single-threaded applications, such as the majority of games. It's still effective in multitasking environments though, as illustrated by the solid Sysmark 2004 SE score of 232 – the highest we've seen from any PC using a single-core CPU.

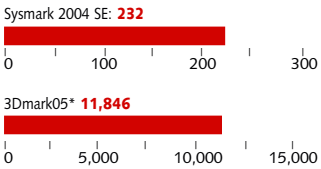
In an effort to further boost the gaming appeal of the Matrix Xtreme PCW, Mesh has enclosed it in a brand new Cooler Master case. It looks impressive, has some interesting features, such as the Musketeer 1 display dials (although they're mainly just for show) and is a definite improvement on Mesh's older-style cases. However, with the power and reset buttons protruding from the top of the chassis, it's all too easy to accidentally activate them by placing an object on the case. If they were sunk further into the case, this wouldn't be an issue.

Sadly, the hyper-quick gaming performance offered by this PC suffers an enormous bottleneck due to Mesh's choice of monitor. We've said it before and will continue to do so: supplying a 19in screen (even if it is the excellent Viewsonic VX912) with a high-performance gaming PC is ill-advised. Its native resolution of 1,280 x 1,024 is simply not high enough to show the two graphics cards in their best light. A 20in display with a resolution of 1,600 x 1,200 would have been infinitely preferable – even if it meant sacrificing other components or pushing up the price.

Other features worth highlighting include a pair of 250GB hard drives, and the Audigy 2 ZS soundcard and 7.1 surround-sound speakers, both courtesy of sound expert Creative. You also get a Force Feedback Saitek Cyborg Evo joystick, although no games are included to get you started.

The Matrix Xtreme PCW is reasonably priced and performs well, but the 19in monitor Mesh has supplied means you won't see what the twin 7800 GTs are really capable of doing. An SLI PC such as this is surely aimed at gamers and deserves a 20in screen. *Rory Reid*

Performance



*Tested at 1,024 x 768 in 32bit colour

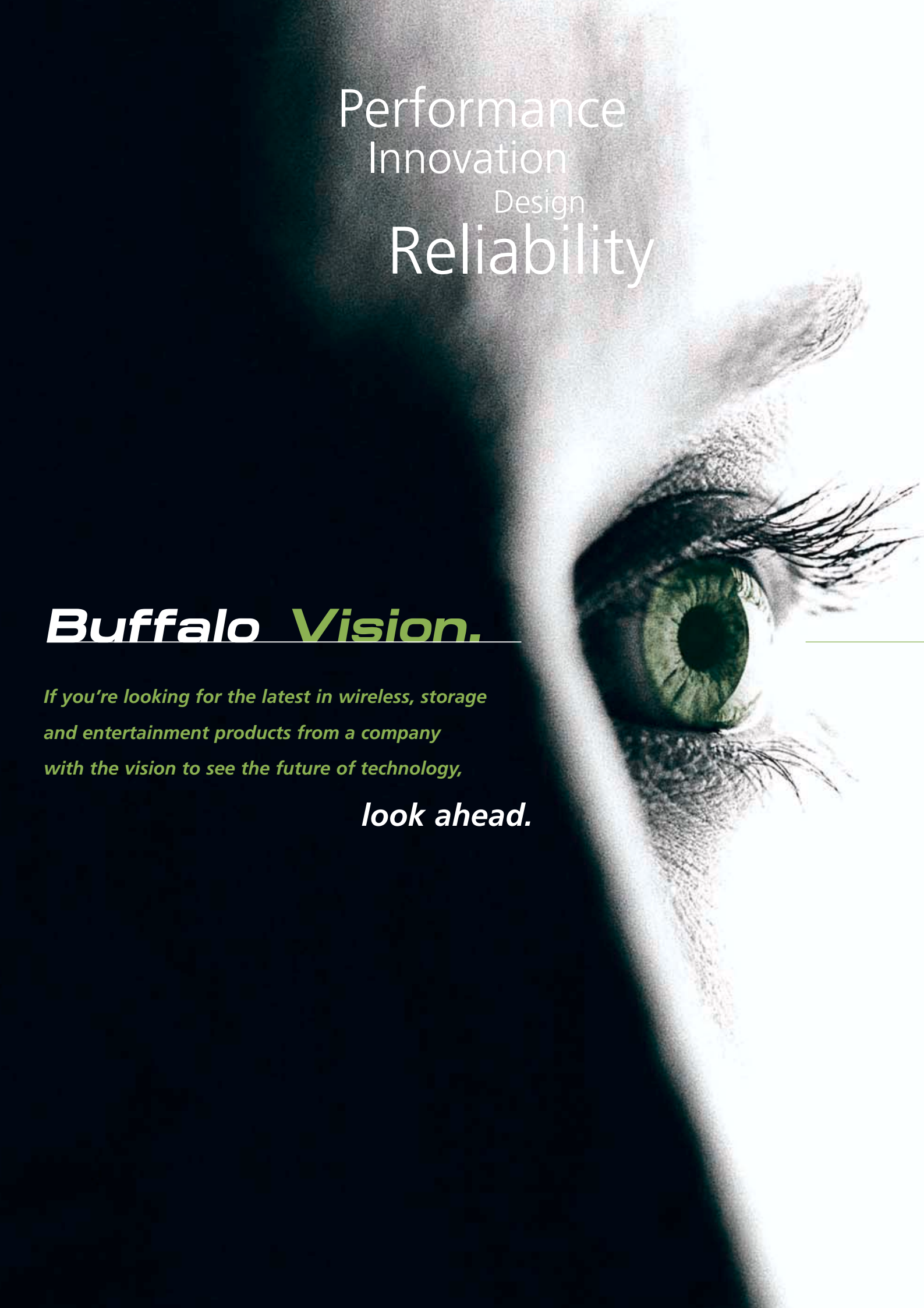
Details

Price £2,199 (plus £39 delivery)
Best price www.pcw.co.uk/bestprices
Contact Mesh 0870 046 4747 www.meshcomputers.com
Specifications AMD Athlon FX-57 • 2 Nvidia Geforce 7800 GTs • 2GB DDR 400 Ram • 19in Viewsonic VX912 • Asus A8N-SLI Deluxe • 2 250GB hard disks • Sony dual-layer DVD-RW • Sony DVD-Rom • XP Home, Microsoft Works 8, Cyberlink suite including Powercinema 4 • Three-year on-site warranty

Verdict

Pros Graphics performance; 2GB Ram
Cons Limited resolution of monitor
Features ★★★★☆
Performance ★★★★☆
Value for money ★★★☆☆

Overall A quality system, but all that graphics power is let down by the 19in monitor
★★★☆☆


Performance
Innovation
Design
Reliability
Buffalo Vision.
If you're looking for the latest in wireless, storage
and entertainment products from a company
with the vision to see the future of technology,
look ahead.

Storage

FIRESTIX

USB 2.0 Flash Drive

With the ever increasing USB Flash capacities, the need for speed becomes ever more important:

- FireStix Flash Drive Capacities 512MB, 1GB, 2GB, 4GB, 8GB
- Buffalo's innovative multi-chip SLC technology delivers the fastest ever USB flash
- Read 32MB/s & Write 27MB/s

Storage

Wireless Networking

Multimedia

bluunplugged.com

more computers

broadbandstuff.co.uk

BUFFALO

www.buffalo-technology.com/pcw

©Buffalo Technology (UK), Ltd. Buffalo Technology and Buffalo Technology logo are registered trademarks of Buffalo Technology (UK), Ltd. The names and logos of other companies mentioned herein belong to their respective owners.

CORPORATE PC

Dell Optiplex GX620

Ultra-quiet system aimed at businesses

The Optiplex GX620 is the latest model in Dell's range of corporate PCs – a line that comprises four new chassis formats, all incorporating Dell's latest design ideas on the BTX form factor.

You can configure the Optiplex range before you buy. The GX620 we reviewed is the base model with an Intel 630 (3GHz) Pentium 4 CPU and Intel i945G chipset combination. It has 512MB of PC4200 DDR2 memory – we would recommend an upgrade to at least 1GB. A monitor is not included.

Graphics performance is relatively poor as it relies on Intel's integrated GMA 950 chipset, which dynamically shares a portion of the system memory, but for the market segment these systems are aimed at, it should suffice.

On our review system, the PCI Express slot was occupied by an expansion card offering a DVI port. Other features include Gigabit Ethernet, an 80GB hard drive and a DVD combo drive.

Dell claims its BTX design reduces noise levels and we have to agree the GX620 is whisper quiet. The chassis design allows the system to be used either as a conventional desktop or as a compact mini tower, which is useful if space is at a premium.

The GX620 also incorporates Dell's new Directdetect information panel, a series of LEDs which shows hard drive activity, network status and other functions. There are also two USB2 and audio ports on the front panel.

The quiet nature of the Optiplex is its main selling point and, as long as you do not run graphics-intensive applications, this configuration will suit most purposes. It is more expensive than some other similar systems, but it does come with a decent three-year on-site warranty. *Simon Crisp*

Performance

Sysmark 2004 SE: **179**

0 100 200 300

3Dmark05* **600**

0 5,000 10,000 15,000

*Tested at 1,024 x 768 in 32bit colour

Details

Price £715.58
(Evalue code: MAG-620VNU)
Contact Dell 0870 152 4699
www.dell.co.uk
Specifications Intel 630 3GHz P4 • 512MB Ram • GMA950 graphics • BTX case • 80GB hard drive • DVD combo drive • USB mouse and keyboard • Windows XP Professional

Verdict

Pros Quiet; good warranty
Cons Poor graphics; 512MB of Ram
Features ★★★★☆
Performance ★★★☆☆
Value for money ★★★☆☆

Overall A quiet system that would suit most corporate environments

★★★★☆

SEMI-RUGGEDISED NOTEBOOK

Rock Hardbook

Find out if this portable can take a PCW beating

The Rock Hardbook is a semi-ruggedised notebook designed to survive the rigours of daily use. Its biggest asset is the partial magnesium alloy casing which, according to Rock, is 20 times stronger than the plastic used in most notebook chassis.

In tests, the casing proved very resilient. Several *PCW* staff members (of varying weights) stood on the notebook with the lid closed, and the TFT panel emerged unscathed. We also took great pleasure in dropping it from Rock's recommended drop height of 70cm without causing any damage.

Unfortunately, the Hardbook's 60GB hard drive does not automatically shut down when it senses tilt, vibration or shock, so dropping it while the notebook is in operation could result in damage.

The eight-speed dual-layer DVD drive has a lockable CD tray. Rock claims this can reduce the likelihood of the drive being damaged, but we cannot envisage many cases in which this would be useful.

More practical is the fact that the Hardbook's keyboard can resist liquid spillages of up to 100cc. We tested this and, again, it did not cause any damage, as you can see from the photo.

The Hardbook uses a 1.73GHz Pentium M CPU and 512MB of Ram. This configuration helps it churn through most applications at a decent rate. We were impressd by the battery life of four hours, 31 minutes.

The Hardbook survived rough treatment in our Labs, but it isn't invincible. There are other notebooks such as Panasonic's Toughbook that have a higher recommended drop height and resistance to small particles, extreme temperature and humidity. But if you are after a sturdy portable that is relatively cheap, the Hardbook is an impressive piece of kit. *Rory Reid*

Performance

Sysmark 2004 SE: **130**

0 100 200 300

Mobilemark **4:31 (hours:mins)**

0 1:00 2:00 3:00 4:00 5:00

Details

Price £1,173.82
Best price www.pcw.co.uk/bestprices
Contact Rock Direct 08709 90 90 90
www.rockdirect.com
Specifications Intel Pentium M 735 1.73GHz • 15.1in display (1,400 x 1,050 resolution) • 512MB DDR400 Ram • 60GB hard drive • Dual-layer DVD-RW • 802.11g • Roxio Creator 7 • 312 x 273 x 27mm (w x d x h) • 3.1kg • Three-year collect-and-return warranty

Verdict

Pros Sturdy; spill resistant
Cons Exposed ports; magnesium alloy adds weight
Features ★★★★☆
Performance ★★★☆☆
Value for money ★★★★☆

Overall Far from invincible but the Hardbook is sturdier than the average notebook

★★★★☆

HD CAMCORDER

Sony HDR-HC1E

High Definition video at a low price and a good quality

Personal Computer World RECOMMENDED

This is no ordinary camcorder. With a 2.97megapixel Cmos sensor and plenty of processing power, the HDR-HC1E from Sony is able to deliver images of a quality that is astonishing for a product of this size and price. By supporting High Definition (HD) video, it packs each image with four times the number of pixels of a Standard Definition (SD) camcorder.

The 2.7in widescreen LCD doubles up as a touch-screen control panel, making menu navigation simple, while the body includes only the number of buttons needed during shooting. These include backlight compensation, night shot, exposure, zoom and focusing.

Boasting an impressive specification, this camcorder combines all the features you could want with enough control and manual features to keep professionals happy. Unlike traditional HD equipment, it's also small and light enough to be carried around by hand.

Sadly, most consumer video-editing packages are not yet ready to cope with HD content. This means HDR-HC1E owners may have to spend a considerable amount on professional software before they're able to get the best from their camera. Similarly, HD video requires far greater processing power to manipulate, and expensive high-resolution monitors to display. Even televisions labelled as HDTV compatible often don't have the resolution to display the full quality supplied by the HDR-HC1E.

The camcorder can also record SD video in the normal way, but what's more impressive is that it can shoot in HD but play back in SD, with the camera performing conversion on the fly. In this way, you can edit your video in SD now, safe in the knowledge that you have an HD master to return to in the future.

Although more expensive than the best consumer SD camcorders, Sony's HDR-HC1E is an excellent low-cost introduction to the world of HD. *Paul Monckton*

Details

Price £1,498.99
Best price www.pcw.co.uk/bestprices
Contact Sony 020 7365 2947 www.sony.co.uk
Specifications HDV and DV capable • 2.97megapixel Cmos sensor • 10x optical zoom • 2.7in touchscreen LCD • Manual zoom ring • Manual focus • Composite, S-video and component video outputs • Image stabiliser • Remote control • Stills shooting mode (max 1,920 x 1,440 pixels) • 71 x 188 x 94mm (w x d x h) • 680g

Verdict

Pros Outstanding video; easy to use
Cons High Definition requires specialist applications
Features ★★★★★
Performance ★★★★★
Value for money ★★★★☆

Overall Easy to use, loaded with features and a great, low-cost introduction to HD

★★★★☆

COMPACT DIGITAL CAMERA

Pentax Optio S5z

A pocket-sized snapper for those fun shots

The latest addition to Pentax's Optio family is the sleek S5z. Based around a 5megapixel CCD and 3x optical zoom, it's compact enough to slip easily into your pocket.

As with most Pentax cameras, the Optio S5z is loaded with features. Most noticeable is the 2.5in LCD viewfinder, although its large size means there's no room for a standard optical viewfinder.

For newcomers to digital photography, the 10 preset mode settings take away the hassle of shooting in just about any condition while a 30fps (frames per second), 640 x 480 movie mode delivers decent video complete with audio. More adventurous photographers will enjoy making use of the live histogram, which is useful when attempting well-exposed shots in awkward lighting.

Photo quality is reasonable, with vibrant colours and good detail, but distant objects can appear a little soft. The auto focus works well, even in dark conditions, although the flash tends to wash out detail in close-up shots.

One annoyance is the time lag between photos. Taking a single shot is quick, but the delay between photos soon becomes irritating, especially when using the flash. Our tests showed that it takes an average of five seconds, although this depends on various factors such as exposure and the speed of your memory card.

In terms of physical design, the control and menu buttons at the back of the device are on the small side, which may be frustrating for users with large hands. However, the rubberised ridge at the edge makes holding the camera comfortable.

It's disappointing that very little has changed from previous Optio cameras, but the S5z is good for casual photographers who want a true pocket-sized camera. Features such as the live histogram are useful, but it's essentially aimed at those who take photos for fun. *Anna Lagerkvist*

Details

Price £249.99
Best price www.pcw.co.uk/bestprices
Contact Pentax 01753 792 731 www.pentax.co.uk
Specifications 2,560 x 1,960 max resolution • 3x optical zoom • 35-107mm (35mm equivalent) • 2.5in LCD screen • 640 x 480 video (30fps) • 10MB internal memory • Li-ion battery • 83 x 21.5 x 55mm (w x d x h) • 120g

Verdict

Pros Small; live histogram
Cons Time lag between shots; few new features
Features ★★★☆☆
Performance ★★★★☆
Value for money ★★★☆☆

Overall A good compact digicam, but very few new features compared to previous Optio cameras

★★★☆☆

SOUNDCARD

Creative Soundblaster X-Fi Elite Pro

With 51 million transistors, the technology behind this system is set to make a big noise

You might be content with your onboard sound chip, but Creative is out to convince you otherwise with its new X-Fi (short for extreme fidelity) range of soundcards.

By housing 51 million transistors, Creative makes the claim that X-Fi is as big a jump from current technology as Soundblaster Live was from the original Soundblaster range.

The changes mainly relate to increased fidelity through support for higher frequency recording and playback, and more audio channels. X-Fi is a modular design, which means the card can load and unload sections of its own system software as required. This leads to three software-switchable modes – gaming, entertainment and audio creation.

So the big question is, does it sound better? Games need to be written (or patched) to take advantage of the technology, but in those that are, such as the X-Fi edition of Unreal Tournament 2004, the sound is noticeably more atmospheric, which results in truly immersive gameplay.

In entertainment mode, X-Fi uses its CMSS-3D technology to up-mix a standard two-channel input in real time for surround-sound speakers. It will also provide virtual surround sound with a two-channel system, such as a set of headphones. CMSS-3D is definitely an improvement on previous virtual surround-sound processing techniques, but its effectiveness varies depending on the type of audio.

The third mode, audio creation, allows for realtime effects processing and makes use of the huge number of inputs on the supplied breakout I/O box (pictured). All audio creation features are accessed through a dedicated interface.

Creative's X-Fi is undoubtedly a huge step forward, but it's expensive and still waiting for mainstream software support. Great for audiophiles and dedicated gamers, but our advice to everyone else is to hold off until support increases and prices fall. *Anthony Dhanendran*

Details

Price £249.99
Best price www.pcw.co.uk/bestprices
Contact Creative http://europe.creative.com
Specifications Creative X-Fi processor • 64MB Ram • 24bit/96KHz • 7.1-channel output • Dolby/THX-certified • Creative drivers and software suite

Verdict

Pros Fantastic sound quality
Cons High price; limited support
Features ★★★★★
Performance ★★★★★
Value for money ★★★☆☆
Overall Impressive technology, but we'd recommend waiting for prices to drop
★★★★☆

WINDOWS-BASED SMARTPHONE

Orange SPV C550

Improved multimedia features displayed on a sharper screen

Orange's updates to its SPV smartphone series are turning into an annual event. The SPV C550 is the latest kid on the block and arrives with a modified design and some new features, although it's still a Windows-based smartphone, which means lots of Microsoft-specific applications.

To improve the multimedia side of the phone, the front fascia now has individual buttons for controlling video, audio and photos. Shortcut buttons for navigating the phone's menus have also been included.

We're not sure why Orange decided to revert to the smaller, more fiddly joystick (first seen on the SPV E100) as we preferred the larger, horizontal four-way button on the SPV C500.

Digital photos are given a boost by the 1.3megapixel camera, but it's still no replacement for a dedicated digital camera. Although the screen resolution hasn't changed, the text is sharper and easier to read – when we switched back to the old SPV C500, we noticed the difference. Bluetooth and infra-red are built in, while GPRS is used for connecting to the Internet or Orange's online content through Orange World. The faster 3G service isn't available on this phone.

Weighing 110g, this update is slightly heavier than the SPV C500 (albeit by only 10g) and a few millimetres bigger. It comes with a 128MB mini-SD card, an unusually large amount of storage for a mobile, but add a few mp3 or wmv files and you'll soon be requiring a larger card.

There's no denying the SPV 550 is a decent phone with lots of great applications and synchronisation features. But, like its predecessors, the interface is painfully slow and the battery life just doesn't compare to non-Windows-based smartphones. *Luke Peters*

Details

Price Depends on contract
Best price www.pcw.co.uk/bestprices
Contact Orange 0500 802 080 www.orange.co.uk
Specifications 1.3megapixel camera • GPRS • HTML browsing • Wap • Bluetooth • Infra-red connection • Java • Mp3 player • Tri-band • Windows compatible

Verdict

Pros Good display; 1.3megapixel camera
Cons Slow interface; poor battery life
Features ★★★★☆
Performance ★★★☆☆
Value for money ★★★★☆
Overall A good smartphone, especially in terms of functionality, but it's still annoyingly slow
★★★★☆

BUDGET MONO LASER PRINTER

Dell Laser Printer 1100

At less than £100 this has no frills, but is easy to use

Mono lasers have plummeted in price recently and Dell's Laser Printer 1100 is yet another to sit below the £100 mark. It prints monochrome A4 pages up to 14ppm (pages per minute), while the easy-to-use drivers provide support and automatic toner management.

By monitoring toner levels, the printer will warn you when the cartridge runs low, and direct you to the correct place on Dell's website to order a replacement. A 1,000-page starter toner cartridge is supplied as standard, but it also accepts a 2,000-page refill cartridge, costing £45.83.

Printing at 600 x 600dpi, it's capable of producing clear, crisp text, while shades of grey are rendered smoothly, without striping or banding. In our labs tests, all the test documents, apart from the full-page photograph, printed at, or very near, the rated speed of 14ppm at 600dpi. The photograph appeared in little more than 20 seconds, but the built-in 2MB of Ram was insufficient to allow us to print this at the full resolution, forcing us to step down to 300dpi, which clearly affected the quality.

With a footprint of 358 x 299mm and smart, minimalist styling, you can tuck away the printer unobtrusively. It's also relatively quiet in operation, allowing you the convenience of keeping it close but not having noisy interruptions.

The Dell Laser Printer 1100 has no unnecessary frills, doesn't bother you with complex configuration issues and works well. On the downside, it's not Mac-compatible and lacks networking support. If you like the look of this printer, you might want to first check out Samsung's ML-1610, which looks almost identical, is rated at 16ppm and is a fair bit cheaper – expect to see a review in *PCW* soon. *Paul Monckton*

Details

Price £93
Best price www.pcw.co.uk/bestprices
Contact Dell 0870 907 5818 www.dell.co.uk
Specifications Mono laser printing • 14ppm • 600 x 600dpi • 150MHz Arm940T processor • 1,000-page starter toner included • USB interface • 150-page input, 50-page output capacity • Windows 98 or higher required • 258 x 299 x 217mm (w x d x h) • 5.5kg • 1yr warranty

Verdict

Pros Easy to set up and use
Cons Small paper capacity and starter toner
Features ★★★☆☆
Performance ★★★★☆
Value for money ★★★☆☆
Overall A simple laser that performs well, although there are cheaper options available
★★★★☆

BLUETOOTH HEADSET

Cellink BTST-9000D

Listen to chords without the hassle of dealing with cords

Fans of music on the go will be familiar with the struggle of untangling headphone wires. One answer is to shoehorn Bluetooth technology into a headset, such as the Cellink BTST-9000D.

The device comes in two parts – the Bluetooth stereo adapter (dongle), which plugs into the audio source, and the headset, which wraps around the back of your head and over your ears.

Setting up the device is straightforward. Just hold down the pairing wheel on the headset for six seconds and hold down the control button on the stereo adapter. When fully charged, they will last for about six hours in use and about a week in standby.

We tested the BTST-9000D with an Ipod, PC and mobile phone. In each case, audio quality was good and the Bluetooth signal stayed constant throughout, even with our mobile stuffed in the bottom of a bag.

Controls on the headset adjust volume and navigate Windows Media Player (when using a PC). You cannot skip tracks on a portable media player but there is an integrated microphone for switching to voice calls on a mobile phone.

The headset is bulky, which garnered a few smirks from fellow commuters when we were testing it. Also, the large triangular padded earpieces do not sit entirely flush on your head. This means you will need to increase the volume in noisy environments and possibly irritate those around you. Some may also find them far too loose, ruling out use during jogging and gym visits.

Lastly, they are very expensive. For the same price you could pick up a decent set of noise-cancelling headphones, which would sound a lot better at lower volume levels and be far more discreet, even if it does mean contending with cables. *Luke Peters*

Details

Price £100
Best price www.pcw.co.uk/bestprices
Contact ODS Distribution
0870 900 6055
www.ods-distribution.com
Specifications Bluetooth • Stereo headset • Noise cancellation • Built-in microphone • 6.5hrs battery life

Verdict

Pros Simple setup; Bluetooth works well
Cons Bulky; do not sit flush over your head; expensive
Features ★★★☆☆
Performance ★★★☆☆
Value for money ★★☆☆☆
Overall A good idea for cable-free portable music but too cumbersome, ungainly and expensive
★★☆☆☆

SATELLITE NAVIGATION

Mio 269

Plenty of features but slow operation

Satellite navigation (sat nav) devices are steadily coming down in price and you will soon see budget models available for less than £200. Although the 269 from Mio looks expensive kits at first glance, the decent collection of features provides excellent value for money.

The device itself is neatly designed, looks stylish and is just about small enough to fit in your pocket. The 3.5in display is bright and has a resolution of 320 x 240. As with most sat nav devices, it can be difficult to see the screen in bright sunlight but the built-in speaker is always on hand to give audio directions.

The Mio 269 is easy enough to use. The menus can be navigated either by using your hand or the stylus, which slots neatly into the casing. Street-level maps are provided for 22 western European countries, and points of interest, such as petrol stations and hotels, are included. The 3D map looks good and is easy to follow, while various other views are available.

Where the Mio 269 falls down is with its slow operation. The map updates fast enough when you are driving around and routes are calculated reasonably quickly, but moving around the map using the stylus is painfully slow – each movement results in a lethargic redraw of the map.

A heap of accessories are included in the package. Along with a car charger, mains adapter, carrying case and earphones, you also get a holder for use in your car. Should the reception falter, the external GPS antenna can be attached to improve matters. There is even a remote control, although we do not envisage this being used a lot.

When considering the total package, including maps and accessories, the Mio 269 excels on price, but it can be annoyingly slow at times. *Will Stapley*

Details

Price £399
Best price www.pcw.co.uk/bestprices
Contact www.mio-tech.be
Specifications 300MHz Intel Xscale processor • 3.5in touchscreen display (320 x 240) • Stylus • Speaker • Western European maps • 2.5GB hard disk • SD card slot • Remote control • 138 x 26 x 78mm (w x d x h) • 232g

Verdict

Pros Price; good features
Cons Slow operation
Features ★★★★☆
Performance ★★☆☆☆
Value for money ★★★★☆
Overall Cheap considering its good range of features, but slow compared with the competition
★★★☆☆

CORDLESS KEYBOARD AND MOUSE

Logitech Cordless Desktop S 510 Media Remote

Stylish set that's loaded with multimedia features

Logitech's Dinovo keyboard, reviewed in *PCW* April, is undeniably stylish (and at £200 also ridiculously expensive), but we loved the extra media functions it offered. The Cordless Desktop S 510 Media Remote reviewed here offers a similar range of features, but at a fraction of the price.

As its name suggests, this desktop set is cordless and uses a simple USB stick to send and receive digital radio transmissions. The set consists of a remote control, known as the Media Remote, a keyboard and a mouse. Looking much like any other remote, the Media Remote is completely separate from the keyboard and packed with multimedia-specific features. These include the ability to control Itunes, Musicmatch, Windows Media Player and Winamp, all from afar.

Using the impressive Medialife software (a Windows Media Center-style application), it's also possible to play music, and view pictures and video files stored on your computer.

The keyboard contains a wealth of shortcut buttons. On the left-hand side are buttons for zooming and rotating digital photos. The right-hand side of the keyboard houses keys for multimedia navigation, while a set of predefined function keys along the top provide instant access to a range of applications.

The mouse is of equal interest. As well as offering an 800dpi resolution and side-tilt scroll wheel, it has an invisible optical light. Logitech claims this consumes less power than red optics and, as a result, allows the mouse to last for a staggering eight months on a single charge. The keyboard power lasts two months shy of the mouse and both have an indicator light that switches from green to red when the juice is 10 days from running out.

The best thing about the whole package is the price. At £59, it offers a heap of functionality and some decent media software. *Luke Peters*

Details

Price £59
Best price www.pcw.co.uk/bestprices
Contact Logitech 020 7309 0127 www.logitech.co.uk
Specifications S 510 cordless keyboard • LX5 800dpi cordless mouse • Media Remote • USB RF receiver (including stand) • Medialife software • 5yr warranty

Verdict

Pros Loads of features; good price
Cons Flat design won't suit all
Features ★★★★★
Performance ★★★★☆
Value for money ★★★★★

Overall **At this price, it's a wonder how Logitech managed to fit in all these features. A great keyboard.**

★★★★★

dabs.com

now easier than ever

NOTEBOOK PCs

quicklinx	ACER	£ inc VAT	£ ex VAT
3S8LPW	3503WLMi M370 256Mb 40Gb	500.00	425.53
3M3JPW	TravelMate 4601LCi P-M 1.6GHz	749.99	638.29
3SBJPW	Ferrari ML37 DVDR 15.4 XPh	1264.99	1076.59
	APPLE		
3N2KPW	Powerbook G4 1.5GHz 512MB 60GB	1087.72	925.72
3NNSPW	Powerbook G4 1.5GHz 512MB 80GB	1429.99	1217.01
	FUJITSU-SIEMENS		
3P6YPW	AMILO L 1300, Intel Cel M 370	549.99	468.08
3RD3PW	V2020 P-M 1.6 256 40 DVDRW XPP	628.61	534.99
3RD5PW	V2020 P-M 735 (1.7GHz, 400MHZ)	669.74	569.99
3P8DPW	P7010 Pentium M753 10.6 WXGA	1174.99	999.99
	HP PAVILION		
3NJDPW	dv1265EA P-M 735 512/100 XPH	898.99	765.10
3NJLPW	dv4045EA P-M 730 512/80 XPH	799.00	680.00
3NJMPW	dv4015EA Cel-M 350 512/40 XPH	598.99	509.78
3NJNPW	zd8123EA P4 530 512/80 XPH	998.99	850.21
3NJPPW	zd8181EA P4 640 1024/80 XPH	1298.99	1105.53
	SONY VAIO		
3NKPPW	FS215B Centrino P-M 740	997.57	849.00
3NKTPW	FS295VP Centrino P-M 740	1197.32	1019.00
3NKYPW	Vaio S4HP/B Centrino P-M 740	1502.82	1279.00
3KJ4PW	Vaio T2XP/S Centrino 753	1551.00	1320.00
3KJ6PW	Vaio S3XP Centrino 760 1GB 80G	1620.32	1379.00
3KJ1PW	Vaio A397XP Centrino 760	1697.87	1445.00
3NKKPW	Vaio A417S Centrino P-M 760	1699.99	1446.80
3NKRPW	Vaio A497XP Centrino P-M 760	1902.32	1619.00
	TOSHIBA		
3R95PW	Tecra A5 Cel-M 370 1.5/XP PRO	676.99	576.16
3KT1PW	Portege A200 P-M 725 1.6GHz	704.99	599.99
3R96PW	Tecra A5 P-M 730 1.6/XP PRO	816.99	695.31
3R91PW	Portege S100 P-M740 1.73/XP	1169.13	995.00
3F90PW	Tecra M2 P-M 735 1.7GHz Centrino	1197.33	1019.00
3LS8PW	Qosmio G10-133 Pentium M 735	1424.99	1212.76

DESKTOP PCs

quicklinx	ACER	£ inc VAT	£ ex VAT
3P8YPW	Foxconn Athlon 64 3000 T140	474.99	404.25
3PJ8PW	T630 Intel P4 540 + 17"monitor	599.99	510.63
	APPLE		
3L8MPW	Mac mini G4 1.25GHz 40GB Combo	338.99	288.51
3K5YPW	PowerMac G5 1.8GHz 256MB 80GB	980.35	834.34
3PBPPW	PowerMac G5-2G DP 160GB 512MB	1529.99	1302.12
	FUJITSU-SIEMENS		
3L5NPW	Scenic X102 Cel D330 2.66Ghz	264.36	224.99
3SMCPW	X102 CEL 2.66 256 40 DVD XPP	353.99	301.27
3SMDPW	X102 P4 2.93 256 40 DVD XPP	415.99	354.03
3RKBPW	E300 i865GV,Cel D335 XP PRO	503.99	428.93
	HP PAVILION DESKTOPS		
3NHKPW	M7091 P4 550 1GB 400GB XPH	1259.99	1072.34
3NHNPW	t3060 P4 540 512/200 XPH	729.99	621.27
3NHTPW	t3040 P4 515 512/160 XPH	549.99	468.08
3NHXPW	a1020 AMD Ath3200+ 512/160 XPH	419.99	357.44
3NJ8PW	a1010 P4 515 256/80 XPH	509.73	433.82
	SONY VAIO		
3GD8PW	Vaio RA204 P4 560 1G/400GB	1256.07	1069.00
3MJ1PW	Vaio RA304 P4 560HT 1G/500GB	1491.07	1269.00
3MR8PW	Vaio V3S P4 3.4GHz 512/250G	1699.99	1446.80

HANDHELDS

quicklinx	HP	£ inc VAT	£ ex VAT
380JPW	iPAQ rz1710 Handheld PDA	170.99	145.52
3JFKPW	iPAQ rz1710 & Tomtom	281.99	239.99
380KPW	iPAQ rx3715	281.94	239.95
380LPW	iPAQ 4700	359.99	306.38
380MPW	iPAQ h6340	385.00	327.66
	PALM		
3FXWPW	Tungsten T5	210.32	170.21
3NH2PW	Tungsten E2	219.99	116.00

COMPONENTS

quicklinx	MEDIA	£ inc VAT	£ ex VAT
32SVPW	dabsvalue RiDisc CD-R 52x80min 100pk	11.92	10.14
3LMLPW	dabsvalue DVD+R 4.7GB 8x in 100pk	17.79	15.14
3GV0PW	Verbatim DVD-R 4.7GB 8x 25pack Spindle	10.52	8.95
	DVD - RECORDERS		
3L90PW	LG DVD+-R/RW DL 16x IDE Beige OEM	39.53	33.64
3KNCPW	NEC ND-3520A DVD+-R/RW 16x DL OEM	37.88	32.23
3KSSPW	NEC ND-3520A DVD+-R/RW 16x DL OEM	37.90	32.25
	INTERNAL IDE HARD DRIVES		
3F9VPW	Hitachi Deskstar 7K80 80Gb ATA100 2MB	31.99	27.22
24YDPW	Maxtor DiamondMax Plus8 40GB UDMA133	27.56	23.45
24YHPW	Maxtor DiamondMax Plus9 80GB UDMA133	33.45	28.46
	SYSTEM MEMORY		
2LGMPW	Crucial 512MB 184DIMM PC3200 CL3	27.86	23.71
37JGPW	dabsvalue 512MB 184DIMM PC3200 CL2.5	36.50	31.06
	FLASH MEMORY		
37R5PW	Kingston 256MB SD Secure Digital Card	16.29	13.86
	USB FLASH DRIVES		
319LPW	dabsvalue 128MB USB 2.0 Flash Drive	11.97	10.18
319MPW	dabsvalue 256MB USB 2.0 Flash Drive	18.55	15.78
3HJLPW	Kingston 512MB USB 2.0 Flash Drive	27.10	23.06
3HJLPW	Kingston 512MB USB 2.0 Flash Drive	27.10	23.06

Prices and product details correct at time of going to press and subject to change without notice. Errors and omissions excepted.

IPAQ RZ1710 GPS NAVIGATOR

The complete in-car GPS navigation system

quicklinx 3QYDPW

This handy device fits perfectly into any vehicle and can easily be swapped from one car to another for the ultimate "Plug & Drive" solution. Also featuring the latest navigation software to provide accurate turn-by-turn visual and voice guidance and an innovative user interface to enable one-touch functionality. A compact, portable and stylish design means this innovative device is not restricted to one vehicle and is easily transportable between cars. Simply insert your iPAQ into the CarCradle and the navigation software automatically starts, with either landscape or portrait viewing options available.

This unique solution combines HP quality, ViaMichelin Navigation software with a high quality GPS CarCradle (including loudspeaker) to deliver a superb all-in-one system.

•Microsoft Windows Mobile 2003 Second Edition Software
•203Mhz •3.5" TFT •BT, WiFi, IRDA •Touch Screen

only **£320.70** (£272.94 ex VAT)

ZEN SLEEK 20GB - SILVER

quicklinx 3RZCPW

Creative's Zen Sleek MP3 player stores up to 10,000 songs* in WMA or 5,000 in MP3. It will record direct from its built-in FM radio & microphone and offers up to 18 hours play.

- Vertical touchpad with LED backlight gives total control with fingertip touch.
- FM tuner with 32 presets and direct recording.
- Built-in mic for live voice recording and personal notes.
- Equalisation feature with 9 acoustic environments such as 'rock' or 'jazz'
- USB 2.0 connection, for downloads at up to a song per second.

*Based on four-minute songs at 64Kbps in WMA, 128Kbps in MP3

•Stores up to 10,000 songs* •Built-in FM radio & microphone
•Up to 18 hours playtime •USB 2.0 connection

only **£184.99** (£157.44 ex VAT)

VAIO FS285E

quicklinx 3S62PW

The FS285E is packed full of features and enough power to handle any task.

- Intel Celeron M 370
- 512MB RAM 80GB HDD
- X-black screen technology
- DVD+/-RW Dual layer

BUY NOW PAY JUNE 06

only **£659.99** (£561.70 ex VAT)

ASPIRE T140 - MEDIA CENTRE PC

quicklinx 3P8YPW

- AMD K8 Athlon 64 3000
- 160GB HDD / 512MB DDR
- DVD RW +/- Dual Layer
- Windows XP Media Centre + Works, Remote Control + Hybrid TV Tuner, Speakers, 9-1 Media Card Reader, Keyboard & Mouse

BUY NOW PAY JUNE 06

only **£474.99** (£404.25 ex VAT)

iPAQ HW6515 MOBILE MESSENGER

quicklinx 3NWDPW

- Intel PXA270 312MHz
- 128MB Memory
- 1.3 Megapixel Camera
- Bluetooth, GSM, GPRS, Infra Red
- Windows 2003 2nd Edition
- 3.0" TFT Display
- Weighs just 165g

BUY NOW PAY JUNE 06

only **£428.87** (£365.00 ex VAT)

LIFEDRIVE

quicklinx 3PPFPW

With a 4GB HDD and built-in Wi-Fi® and Bluetooth® wireless support, the LifeDrive™ mobile manager from palmOne lets you easily carry all the essentials of your busy life. Files and folders from your desktop computer, 300 songs, 2.5 hours of video, 1000 photos, and more are right there with you.

only **£292.57** (£249.00 ex VAT)

FINEPIX F10 ZOOM

Introducing the FinePix F10 Zoom ...the stamina camera

FUJIFILM

quicklinx 3N6QPW

Most digital cameras are only part-timers. Why? As the day wears on, their batteries start to run dangerously low, and their low-light performance is beset by image quality problems. The F10 Zoom, with its new Real Photo Processor, is the exception. With a 500-shot battery life and an incredible sensitivity range of ISO 80 to 1600, the FinePix F10 Zoom is a camera to be used at any time, day or night.

- Super CCD sensor delivering 6.1 million effective pixels
- High resolution 2.5-inch LCD monitor for optimum clarity and detail
- 3x optical zoom lens
- 500-shot battery life
- Class-leading sensitivity setting for low light conditions
- VGA movie capture of 30 frames per second with sound

•6.1 Megapixels •3x optical zoom •500 shot battery life
•VGA movie capture •Large 2.5" LCD display

only **£219.99** (£187.23 ex VAT)

AL1715S 17" TFT DISPLAY

acer

quicklinx 3P3SPW

Upgrade your PC system with the AL1715s, a reliable solution to render the ergonomical benefits of LCD technology. The slim and compact silver design liberates the workplace transforming the computing area into a modern work or entertainment area. The AL1715s is the ideal solution for home or office PC users requiring a smart interface with rapid response times for the best in digital playback and digital movies.

IDEAL FOR MOVIES & GAMING

•17" TFT •1280 x 1024 resolution •500:1 contrast ratio
•12ms response time •Silver/Black finish •TCO '99

only **£145.64** (£123.95 ex VAT)

PHOTOSMART 8250 PHOTO PRINTER

NEW

hp invent

quicklinx 3RFDPW

Get professional quality photos at breathtaking speeds with the world's fastest photo printer. Enjoy efficient printing with 6 individual HP Vivera ink tanks linking into a unique HP ink recirculation system for maximum pages per cartridge.

only **£158.34** (£134.76 ex VAT)

DVD+-R/RW DUAL LAYER IDE

FIT 8.5GB ON A SINGLE DISK

NEC

quicklinx 3P68PW

The ND3540 16x dual layer DVD writer will write and re-write all your data on a range of media at exceptional speed. Capable of writing DVD-R and DVD+R at a speed of 16x, you can burn one hour of DVD in 4 minutes! What is more, the dual layer compatibility will allow you to store up to 8.5 GB of data on one disc.

only **£47.09** (£40.08 ex VAT)

ADSL MODEM ROUTER & USB ADAPTER

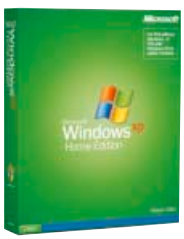
BELKIN

quicklinx 3MR0PW

Belkin networking offers this one-box solution that lets you share your ADSL Internet connection, files and peripherals without cables. It comes with a Wireless G USB 2.0 Network Adapter to allow you to easily connect your USB-equipped computer to your wireless network.

only **£74.00** (£62.98 ex VAT)

WINDOWS XP HOME EDITION SP2



Microsoft

quicklinx 39HDPW

Microsoft Windows XP Home Edition is the next version of the Windows operating system, which is designed exclusively for home computing. Windows XP Home Edition puts the exciting experiences of the digital age at your fingertips.

only **£149.98** (£127.65 ex VAT)

DIGITAL CAMERAS

quicklinx	CANON	£ inc VAT	£ ex VAT
3LHPPW	Powershot A510	123.38	105.00
3MJPPW	Ixus 700	276.13	235.00
3MHXPW	EOS 350D Digital SLR Body Only	616.88	525.00
3NYGPW	Powershot S2 IS	350.35	298.17
	FUJI		
3N2TPW	FinePix A350	124.97	106.36
39J1PW	FinePix S3500	149.99	127.65
39J2PW	FinePix S5500	174.36	148.39
3N6QPW	FinePix F10	220.00	187.23
2SRHPW	Finepix S7000	305.50	260.00
	HP		
32XSPW	HP Photosmart R707	149.95	127.62
	PENTAX		
3N1TPW	Optio 50	116.33	99.00
3QBZPW	Optio Svi	207.29	176.42
3QZCPW	Optio S5z	207.53	176.62
3JQXPW	Optio iST DS	680.99	579.57
	SONY		
3FPLPW	DSC-L1 Cyber-shot 4.1MP	200.00	170.21
3456PW	DSC-P100 Cyber-shot 5MP	200.00	170.21
3L5JPW	DSC-P200S Cyber-shot 7.2MP	239.09	203.48
3L8FPW	DSC-T33 Cyber-shot 5.1 MP	237.35	202.00
2QL2PW	DSC-F828 Cyber-shot 8 Megapixels	515.83	439.00

PRINTERS & SCANNERS

quicklinx	PRINTERS	£ inc VAT	£ ex VAT
3F1BPW	Canon PIXMA iP4000	82.25	70.00
3GW6PW	Canon PIXMA iP6000D	129.25	110.00
3GW7PW	Canon PIXMA iP8500	257.33	219.00
376ZPW	Epson Stylus C46UX	35.25	30.00
3770PW	Epson Stylus C66	49.76	42.35
300MPW	Epson Stylus Photo R200	61.10	52.00
2TDXPW	Epson Stylus Photo R300	84.60	72.00
356JPW	Epson PictureMate	126.00	107.23
37MLPW	HP Photosmart 325	95.26	81.07
37MVPW	HP Photosmart 375	138.90	118.21
37MYPW	HP Photosmart 8450	215.44	183.35
	ALL-IN-ONE PRINTER/SCANNER		
3Q5DPW	Pixma MP760	251.99	214.46
3H9TPW	Pixma MP110	75.00	63.83
3DWYPW	Stylus Photo RX-420	74.03	63.00
37XJPW	Stylus Photo RX-700	271.99	231.48
35FKPW	HP PSC 1215	61.95	52.72
35FMPW	HP PSC 1315	89.32	76.02
3L2QPW	HP PSC 1610	123.97	105.51
	SCANNERS		
38HXPW	Canon LiDE 35	52.88	45.00
3LL4PW	Canon LiDE 500F	123.38	105.00
3958PW	Epson Perfection 2580	84.60	72.00
2Q9GPW	Epson Perfection 3170 Photo	136.09	115.82
3JXDPW	HP Scanjet 4670vp	135.97	115.72
2R84PW	HP ScanJet 5530C	186.04	158.33

LCD DISPLAYS

quicklinx	LCD DISPLAYS	£ inc VAT	£ ex VAT
3JV5PW	Acer AL1912S 19" TFT Silver/Black	194.67	165.68
3JD0PW	AG Neovo F417 17" TFT Display Black	143.34	121.99
3JWZPW	AG Neovo F419 19" TFT Display Black DVI	187.98	159.98
36GYPW	LG L1715S 17" TFT Display Silver	147.40	125.45
3R71PW	Iiyama Prolite H431S-B 17" TFT BLACK	229.82	195.59
3R66PW	Iiyama 17" TFT Prolite E431S Silver	209.89	178.63

ESSENTIALS

quicklinx	WIRELESS NETWORKING	£ inc VAT	£ ex VAT
2THQPW	Dlink Wireless PCI 11Mbps Adaptor	16.32	13.89
31NRPW	Dlink DWL-G650+ Wireless PCMCIA Card	22.65	19.28
332DPW	Dlink DWL-2100AP Wireless Access Point	80.07	68.15
2CS4PW	Belkin 802.11G Notebook Card	20.66	17.58
25MGPW	Belkin Bluetooth USB Adapter	27.97	23.80
2CS8PW	Belkin 802.11g Wireless Cable/DSL Router	42.77	36.40
	KEYBOARDS		
3H7VPW	Logitech LX700 Cordless Desktop	52.66	44.82
3JQDPW	Logitech DiNovo Media Desktop 2.0	114.42	97.38
3FKHPW	Microsoft Optical Desktop with Fingerprint	47.35	40.30
3NFYPW	Microsoft Wireless Optical Desktop 1000	25.78	21.94
	MICE		
2T84PW	Logitech MX900 Optical Mouse Bluetooth	65.14	55.44
3FPQPW	Logitech MX1000 Laser Cordless Mouse	43.48	37.00
22XSPW	Microsoft Notebook Optical Mouse	13.88	11.81
	POWER PROTECTION		
2D4CPW	1-Way SurgeCube	6.30	5.36
3FHZPW	4-Surge Protected Sockets BUY 1 GET 1	18.74	12.76
2V43PW	1000VA Universal UPS w/AVR	111.10	94.56

SOFTWARE (FOR WINDOWS)

quicklinx	SOFTWARE	£ inc VAT	£ ex VAT
3P9WPW	Adobe Creative Suite Pre CS2 VU Win	443.99	377.86
3GS6PW	Adobe Photoshop Elelents/Premier Ele	98.31	83.67
3G7SPW	Ahead Nero v6 Reloaded	51.86	44.14
3FJYPW	Jasc Paint Shop Pro 8	97.03	82.58
2PWBPW	Macromedia DreamWeaver MX 2004	324.98	276.58
2RYWPW	Microsoft Office 2003 Professional	376.00	320.00
308KPW	Pinnacle Studio 9	36.31	30.90
3GB0PW	Pinnacle Studio 9 PLUS	61.65	52.47
39VZPW	Symantec Norton AntiVirus 2005	33.78	28.75
3F8XPW	Symantec Norton Internet Security 2005	42.29	35.99

APC Wireless Mobile Router

Price: £39.99 **Contact:** www.apc.com **Overall** ★★★★☆

Better known for its uninterruptible power supplies, APC is branching out into the world of mobile computing accessories. This 3-in-1 device serves as an access point, router and Ethernet Client. The latter lets you attach the Wireless Mobile Router to an Ethernet port on any device, such as an Ethernet media streamer, and will act as a wireless bridge to your network.

It is 802.11g compatible and the lack of an external antenna doesn't limit coverage. Wep, WPA and the built-in firewall can be accessed through a web interface, while an awkwardly stiff switch on the side of the router lets you swap between the different modes.

With a low price tag, this is a versatile and easy-to-use device. *Will Stapley*

Maxtor Onetouch II Firewire 800

Price: £179 **Contact:** www.maxtor.com **Overall** ★★★★★

Thanks to the silver Mac G5-esque chassis, the Onetouch II cannot be faulted in terms of style. A 300GB hard drive sits within, with Maxtor suggesting you split this into storage and backup portions.

Both USB and Firewire 800 connection options are offered. Two Firewire 800 sockets sit at the rear, allowing you to link up additional Onetouch II drives. These can then be stacked on top of each other; if you are just using a single drive, a stand is provided so the Onetouch II can sit vertically.

A copy of the backup utility Dantz Retrospect Express is included, while Drivelock adds extra security by assigning a password to the drive's contents.

This is a quality storage device at a good price. *Will Stapley*

Hercules Wireless Router

Price: £75 **Contact:** http://europe.hercules.com **Overall** ★★★★☆

Former graphics card manufacturer Hercules has taken its first step into the wireless ADSL router market. In an attempt to make installation as simple as possible, the setup procedure is unlike any other we have seen, providing simple instructions, diagrams and example scenarios. It doesn't ask you to set up Wep security by default, but tells you how to do it.

There's no high-speed technology; standard 802.11g coverage and speed is adequate for most home users. PCI, PC Card and USB Wifi adapters are available for around £25.

The router is far bulkier than others we've seen and comes with a clunky UK plug adapter. Cheaper models are available but this is one of the easiest to use. *Will Stapley*

NEC ND-3540A

Price: £35 **Contact:** www.nec.co.uk **Overall** ★★★★★

The ND-3540A is the latest drive in NEC's internal DVD writer range. Unlike previous models, this one is able to write to dual-layer DVD-R discs as well as DVD+Rs. With the dual-layer DVD+R write capability boosted to eight-speed, an 8.5GB disc takes just 19 minutes to fill. Dual-layer DVD-R is slightly slower at six-speed and takes 21 minutes. The high-speed media to take advantage of these speeds is difficult to get at present, but this will soon change.

At £35, we are hard-pushed to find reasons not to buy the NEC ND-3540A. It does not have Lightscribe capabilities but we doubt that will put off too many people. If you want a multiformat internal dual-layer DVD writer, look no further. *Rory Reid*

my style inside

MSI recommends Microsoft® Windows® XP Professional

Appealing, Classy, Vibrant
Live life to the fullest!

Whether personal or business-related, your choice affects your success in every aspect of your life. MSI keeps your work and life in balance, so you don't have to compromise!

The MSI MEGA BOOK lets you enjoy the best possible quality of life!

This picture is copyrighted and protected by Bose Taipei 101

MEGABOOK S270

- AMD Turion TM 64 Mobile Technology
- Support Turion 64, Athlon 64, Sempron Mobile Processor
- Support Cool and Quiet Technology
- ATi RS480M Chipset
- Built-in 802.11b/g Wireless Function
- Built-in Microsoft Windows XP Home Edition

- Microsoft® Windows XP Home Edition
- 12.1" Super Glare WXGA Display
- Built-in Combo Drive
- Slim & Light Weight Design & Stylish White Chassis
- Cool your Laptop with MSI ACS
- 256MB DDRAM, 40GB HDD, 3 in 1 Card Reader
- 8 Cells Battery
- Free Mouse & Carrying Bag

12.1" TFT LCD

802.11b/g Wireless Function

AMD Turion 64 Mobile Technology

AMD 64 Mobile Athlon

www.msicomputer.co.uk

Morgan
www.morgancomputers.co.uk

MSI
MICRO-STAR INTERNATIONAL

evesham TECHNOLOGY

WORLD CLASS COMPUTERS

Evesham Technology

Service, Quality, Reliability and Choice

Axis 64 Dominator - The ultimate next generation

Multi-tasking has become a way of life, but sometimes your PC just can't keep up with everything you want to do on it at the same time. The AMD Athlon™ 64 X2 Dual-Core processor enables true multitasking—taking computing to an all new level.

ATI Radeon® X800 Graphics Technology defined a totally new High-Definition Gaming experience for the avid gamer by maximizing performance and image quality in higher detail and at higher resolutions than ever before.

power-house PC, now with DUAL-CORE processor!

Quest A30

Our best value AMD Athlon 64 PC with 17" TFT flat panel display

- AMD Athlon 64 processor 3000+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- ATI Radeon XPRESS 200 chipset motherboard
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 160GB 7200rpm hard drive with 8MB buffer
- ATI Radeon XPRESS 200 series graphics (on-board)
- 17" flat panel TFT display
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- Sound Blaster compatible audio
- Microsoft keyboard and optical wheel mouse (black)

10/100 network connection - 4xUSB2.0 - Mini tower case 352x180x365mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1 year return-to-base service (parts & labour). National rate telephone support. - **Floppy drive and modem are optional**

£599 inc VAT (£509.79 ex VAT)

Also available with 17" Sony HS X-Black TFT:

£674 inc VAT (£573.62 ex VAT)

Shown with 17" Viewsonic VX715 DVI TFT (16ms)

Axis 64 KD

Great Value PC - Now with PCI Express graphics

- AMD Athlon 64 processor 3200+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce4 motherboard with dual channel DDR
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB Serial ATA 7200rpm hard drive with 8MB buffer
- 256MB NVIDIA® GeForce™ 6200 w/ TurboCache™ technology*
- 17" TFT flat panel monitor
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Altec Lansing 121 2.1 speakers
- Microsoft keyboard and optical wheel mouse (black)

10/100 network connection - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1st & 2nd year in-home service (parts & Labour). 3rd year return-to-base (parts & labour). National rate telephone support & bigFix pre-emptive support. - **Floppy drive and modem are optional**

£799 inc VAT (£680.03 ex VAT)

Also available with 17" viewsonic VX715 TFT:

£809 inc VAT (£688.51 ex VAT)

Shown with 17" Viewsonic VX715 DVI TFT (16ms)

Axis 64 MKR

"Packed with features... a great choice" PC Pro, Recommended

- AMD Athlon 64 processor 3500+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce4 motherboard with dual channel DDR
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB Serial ATA hard drive with 8MB buffer
- 256MB ATI Radeon X700 PCI Express graphics
- 17" flat panel TFT display
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft® cordless keyboard and cordless optical tilt mouse

10/100 network connection - Firewire port - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1st & 2nd year in-home service (parts & Labour). 3rd year return-to-base (parts & labour). National rate telephone support & bigFix pre-emptive support. - **Floppy drive and modem are optional**

£899 inc VAT (£765.11 ex VAT)

Also available with 19" viewsonic VX912 TFT:

£994 inc VAT (£845.66 ex VAT)

MICROSOFT ESSENTIALS - OVER **£200** WORTH OF SOFTWARE FOR ONLY **£40**!

MS Autoroute 2005 worth £35.69 - MS Money 2005 worth £17.99 - MS Encarta 2005 Encyclopedia Standard Edition worth £16.45 - MS Word 2002 worth £84.99 - MS Works 8 worth £31.48 - MS Photo Premium 10 worth £26.99.

Only available at the time of purchase of a new Evesham system. RRP's taken from www.amazon.co.uk on 16/02/05. Supplied software titles are OEM versions not full retail versions. Product pictures are for illustrative purposes only.

Price does not include delivery which is £34+VAT (£39.95) for PCs, £16.98+VAT (£19.95) for notebooks, FREE for peripherals - UK mainland only. All systems and upgrades are subject to availability. Prices correct at date of publication. Price and specifications subject to change without notice. Finance is subject to status. Evesham's Terms and Conditions apply and are available on request. Actual products may not match photographic representations. Technical Support opening hours are Monday to Saturday 9:00 to 17:20. On-site warranty applies to UK mainland only, monitors are covered directly by the monitor manufacturer. Featured systems are based upon the original award winning specification. Bundled versions of video cards, sound cards and software are not full retail

Evesham Technology recommends Microsoft® Windows® XP

Best PC Firm 2004

Best PC Manufacturer 2001-2003 Company of the Year 2004

Best Computer Manufacturer 2001-2003

Best Laptop Performance Award 2003 & 2004

Best PC Service & Reliability 2001-2003

Brand of the Year 2003 & 2004

Axis 64 Dominator

"An absolute bargain" Trusted Reviews, Recommended

- AMD Athlon 64 X2 processor 3800+
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce 4 motherboard with dual channel DDR
- 1GB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 250GB Serial ATA hard drive with 8MB buffer
- 256MB ATI Radeon X800GT PCI Express graphics
- 17" Viewsonic VX715 DVI flat panel TFT display (16ms response)
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft® cordless keyboard and cordless optical tilt mouse

GOLD 3YR WARRANTY

£1099 inc VAT (£935.32 ex VAT)

Also available with 19" viewsonic VX912 TFT: £1184 inc VAT (£1007.66 ex VAT)

Standard Features

10/100/1000 network connection - Firewire port - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1st & 2nd year in-home service (parts & labour). 3rd year return-to-base (parts & labour). National rate telephone support & bigFix pre-emptive support. - **Floppy drive and modem are optional**

Evolution Lightning

Powerful Intel pentium 4 3GHz PC with multi format DVD burner for only £729inc VAT

- Intel Pentium 4 processor 530 (3GHz, 1MB cache, 800MHz) supporting Hyper-Threading Technology
- Microsoft® Windows® XP Home Edition
- Intel 915P chipset motherboard with PCI Express, 1Gb LAN, dual channel DDR and Hyper-Threading support
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 160GB Serial ATA 7200rpm hard drive with 8MB buffer
- 256MB NVIDIA® GeForce 6200 graphics with TurboCache™ technology*
- 17" flat panel TFT display
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Sound Blaster SBS260 speakers
- Microsoft keyboard and optical wheel mouse (black)

10/100 network connection - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1 year return-to-base service (parts & labour). National rate telephone support. - **Floppy drive and modem are optional**

£729 inc VAT (£620.43 ex VAT)

Also available with 17" Sony HS X-Black TFT:

£804 inc VAT (£684.26 ex VAT)

Quest Roma T37

"Next generation AMD based notebook... the ULTIMATE desktop replacement"

- AMD Turion™ 64 Mobile Technology MT-37
- Microsoft® Windows® XP Home Edition
- 512MB DDR RAM, 333MHz
- 80GB, 5400rpm hard drive
- 15.4" WXGA widescreen TFT display (1280x800)
- 128MB ATI Mobility Radeon X700 graphics
- DVD/CD-RW/Dual Layer DVD-RW drive
- Wireless Mini PCI 802.11bg (54Mbps) LAN
- Bluetooth
- Built in media card reader (MMS, MS, SD)
- 8 cell Li-Ion battery (life up to 2.5hrs approx.)
- Weight - 2.8kg
- Dimensions - 355mmx255mmx30mm

4xUSB2.0, Firewire, VGA, PCMCIA Type II x 1 - 10/100 LAN, v90 56k modem - built-in audio & speakers - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1 year return-to-base service (parts & labour). National rate telephone support.

£899 inc VAT (£765.11 ex VAT)

Voyager C510

"Highly recommended. Great performance"

- Intel Pentium M processor 750 (1.86GHz, 2MB L2 cache, 533MHz)
- Microsoft® Windows® XP Home Edition
- 512MB DDR2 RAM 533MHz
- 80GB, Serial ATA 5400rpm hard drive
- 15.4" WXGA widescreen display (1280x800) (Upgrade to WSXGA 1680x1050 for only £49.99)
- 128MB NVIDIA GeForce Go 6600 PCI Express graphics
- DVD/CD-RW/Dual layer DVD-RW drive
- Wireless Mini PCI 802.11abg (54Mbps) LAN
- Built in media card reader (MMC, SD, MS-Pro)
- 8 cell Li-Ion battery (life up to 4hrs approx.)
- Weight - 2.9kg
- Dimensions - 357mmx276mmx35mm

5xUSB2.0, Firewire, VGA, TV-out, PCMCIA Type II x 1 - 10/100 LAN, v90 56k modem - built-in audio & speakers - Audio DJ music control buttons - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates. Warranty: 1 year in-home service (parts & Labour). 2nd & 3rd year return-to-base (labour). National rate telephone support & bigFix pre-emptive support.

£1056 inc VAT (£898.723 ex VAT)

FREE UPGRADE

Limited offers on the Voyager C510.
FREE screen or **FREE battery** upgrade!

Choose a FREE second battery (worth £89.99) for an impressive 6hr total battery life **OR** choose the stunning WSXGA display with 1680x1050 resolution (worth £49.99) for an even better visual experience.

Call 0870 160 9530

To contact your nearest store call 0870 160 9800

Click www.evesham.com

Altrincham | Birmingham | Bournemouth | Bristol | Cambridge | Evesham | Glasgow | Leeds | London | Norwich | Milton Keynes | Nottingham | Peterborough | Reading | Southampton | Swansea | Tunbridge Wells

packs, and the software features on-line documentation. Hard disk capacities are quoted in thousands of millions of bytes and are prior to installation of operating systems and other applications. e2go models are those that we try to keep in stock for immediate despatch. As part of our staff training some telephone calls may be monitored. AMD, AMD Athlon and AMD Turion are trademarks of Advanced Micro Devices. Intel, the Intel Inside logo, Celeron and Pentium 4 are trademarks of the corporation. *NVIDIA® TurboCache™ technology shares the capacity and bandwidth of dedicated video memory and dynamically available system memory for turbocharged performance and larger total graphics memory. Featured systems available until the 31/10/05. E&OE.

MOTHERBOARD

MSI 945P Platinum

Output audio in real time to DTS 7.1-channel speakers

MSI's 945P Platinum motherboard uses Intel's 945P Express chipset and supports the full range of socket 775 CPUs. This support includes the dual-core Pentium D series processor. Its range of features is very similar to rival boards using the same chipset, and the board itself has a clean, well thought-out design. So what makes it stand out?

The feature MSI is shouting about most is that this is the first motherboard to support realtime DTS (Digital Theatre Systems) audio – DTS is the main rival to Dolby's digital standards. Known as DTS Connect, this technology means you will be able to output digital audio signals to full DTS 7.1-channel surround sound, or upmix two-channel stereo mp3 tracks or CD audio to 7.1 channels.

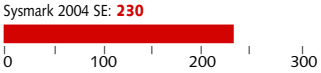
Both optical and coaxial digital audio outputs are present but you will need a DTS decoder to take full advantage of this, along with a suitable set of surround-sound speakers.

One notable omission from this board is SLI (Scalable Link Interface) dual graphics card support so, if you are a hardened gamer planning to make use of a couple of Nvidia's cards, you will have to look elsewhere. Aside from this, all the usual bells and whistles are included. Four Sata II ports, DDR2 533/677 memory slots and three IDE ports combine with a single x16 and two x1 PCI Express sockets. Gigabit Lan is available for high-speed wired networking, along with four USB2 ports.

DTS Connect will certainly interest audiophiles, but not that many people have a set of the DTS surround-sound systems which are required to use the technology. The lack of SLI support is surprising, but it is still a well-designed board with all the features you would expect from a 945P-based motherboard. *Rory Reid*

Performance

Sysmark 2004 SE: **230**



3Dmark05* **6,111**

*Tested at 1,024 x 768 in 32bit colour

Details

Price £99
Best price www.pcw.co.uk/bestprices
Contact MSI 020 8813 6688
http://msicomputer.co.uk
Specifications Socket 775 CPU (including dual-core) • DDR 533/677 memory • DTS Connect • 4 Sata II • 1 x16 PCI Express • 2 x1 PCI Express • 3 IDE • Gigabit Lan • 4 USB2

Verdict

Pros DTS Connect support
Cons No SLI; requires DTS speakers
Features ★★★★☆
Performance ★★★☆☆
Value for money ★★★☆☆

Overall The DTS Connect inclusion is admirable but will only appeal to audiophiles and requires DTS speakers

★★★☆☆

BACKUP HARDWARE

Storcase Data Express

Keep files safe and secure with this removable drive

Most new PCs come with a DVD writer, which makes backing up data a fairly easy task – at least that's the idea. In reality, this can be a painfully slow process if you are backing up large amounts of data, even with the latest DVD burners. With hard drives becoming ever cheaper, they can serve as a quicker way of backing up your files.

Taking this on board, Storcase has developed a range of Data Express removable hard drive caddies, with versions that support ATA/100 and ATA/133, Serial ATA and SCSI drives. You can also buy Data Express caddies preloaded with hard disks, as well as more robust models designed to withstand the occasional knock.

As well as backup use, these Data Express devices mean that when you shut down your PC, you can simply pull out the hard drive and take it away with you. This is a real security bonus if you are storing sensitive data.

Storcase's Data Express S21P108 is one complete backup solution that features a hard drive and fits in a standard 5.25in bay. It comprises a DE110 lockable frame and drive carrier, Seagate 120GB ATA drive and all the necessary internal USB2 cables. Also included is a copy of Danz Retrospect Backup, which makes the job of backing up more user friendly.

If your PC does not have a spare 5.25in drive bay, the S21P106 offers the same security as its bigger sibling and, using a smaller DE50 frame and carrier, fits into a 3.5in bay (a 5.25in adapter is also included). Due to its small size, the DE50 frame will only accept more expensive 2.5in notebook drives – the S21P106 comes with a 40GB model as standard.

The Data Express from Storcase is a convenient and quick way to back up and secure data, but it is also expensive. *Simon Crisp*

Details

Price SP21P108: £234; SP21P106: £215
Best price www.pcw.co.uk/bestprices
Contact Insight 0800 333 333
www.insight.com/uk
Specifications USB2 • Internal USB cable • Danz Retrospect Backup software • SP21P108: 120GB 5.25in drive bay • SP21P106: 40GB 3.5in or 5.25in drive bay

Verdict

Pros Easy and secure way to back up data
Cons Expensive form of backup
Features ★★★★☆
Performance ★★★★☆
Value for money ★★★☆☆

Overall Good for backing up, but it's not the cheapest method

★★★☆☆

Enermax CS-718 Maxflow

Price £109 **Contact** www.scan.co.uk **Overall** ★★★★★

This server-sized CS-718 Maxflow case from Enermax is constructed from sturdy 0.8mm steel with an aluminium front.

Using an inverted layout, the CPU sits at the bottom of the case with a large wind tunnel situated just above it.

At either end of the wind tunnel is a 12cm fan, one to pull in air from the front of the case and another to draw hot air away from the processor.

The front fascia is dominated by a large dial, which can be used to control up to four case fans, while four USB2 sockets, audio ports and a single Firewire port sit next to an LED display that shows fan speed and temperature.

The CS-718 Maxflow is a quality case at a good price.

Foxconn 915PL7AE-8EKRS

Price £72 **Contact** www.novatech.co.uk **Overall** ★★★★☆

Foxconn's latest motherboard combines the Socket 775 architecture with DDR1 memory. It also offers support for both PCI Express and AGP graphics cards.

A standard x16 PCI Express graphics slot sits on the board along with a slot called an FGE (Foxconn Graphics Extension), which allows the use of standard AGP cards. Two Dimm slots support up to 2GB of DDR 266/333/400 memory.

The board is based around the PL version of Intel's 915 chipset and uses the ICH6R southbridge – this allows the four Sata/150 ports to be built into a Raid array.

There is also a separate ATA100 port and integrated Gigabit Ethernet for high-speed wired networking.

FSP Zen 300W

Price £71 **Contact** www.vadim.co.uk **Overall** ★★★★☆

If you are looking to build a quiet PC, you don't want to spoil all your hard work by slapping in a noisy power supply unit (PSU). What you need is a fanless PSU, such as the FSP Zen 300W.

As the name would suggest, the Zen 300W is a 300w unit. To ensure maximum cooling, the all-important heatsinks are made from aluminium, while the chassis is littered with ventilation holes. Power cables are kept neat and tidy, thanks to a blue mesh.

The PSU also comes with a 24pin ATX and 12v auxiliary cable, along with two Serial ATA (Sata) and six 4pin Molex connectors.

The Zen 300W is relatively expensive for a PSU but is well worth the money if you want a quiet PC.

PNY Geforce 7800GTX

Price £417.79 **Contact** www.boffindirect.com **Overall** ★★★☆☆

Joining the ranks of Nvidia Geforce 7800 GTX graphics cards is PNY's offering. Unfortunately it arrived too late to be included in last month's group test.

PNY has not done a great deal to alter the reference design and it features the same cooler as seen on most other 7800 GTXs.

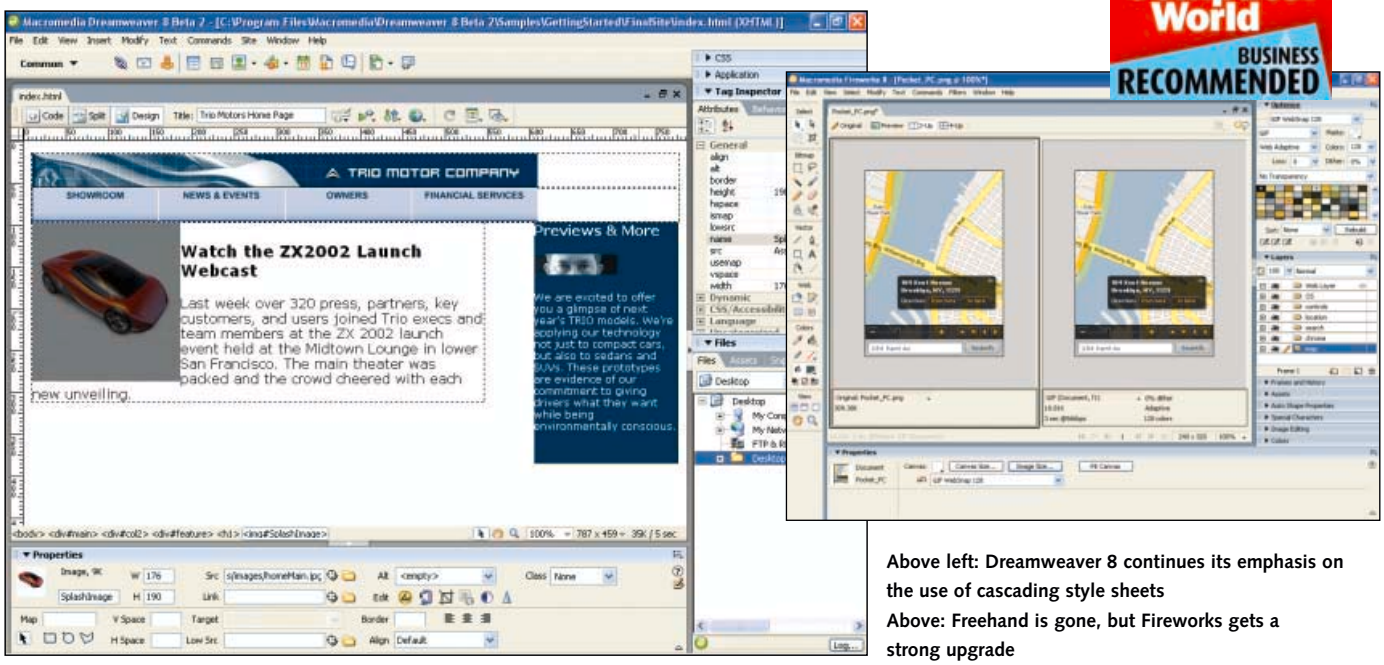
The standard core clock speed of 430MHz came as no surprise, while the 600MHz (1,200MHz effective) memory clock is also standard fare. Our benchmarks returned a score of 7,490 in 3Dmark05 at a resolution of 1,024 x 768 and 72.39 frames per second in Far Cry.

The Geforce 7800GTX is a solid enough card from PNY, but it is also one of the more expensive 7800 GTXs on the market.

WEB DESIGN SUITE

Macromedia Studio 8

Creating pages for the Internet has become even easier



Above left: Dreamweaver 8 continues its emphasis on the use of cascading style sheets
Above: Freehand is gone, but Fireworks gets a strong upgrade

Although Adobe's takeover of Macromedia is yet to be finalised, the latest version of Macromedia's Studio web design suite has clearly been influenced by the imminent merger.

One obvious change is that the Freehand vector graphics program is no longer included. Macromedia will continue to support it, but Freehand is being edged out to allow Adobe's Illustrator to rule the vector graphics market. The four main programs included within Studio 8 now concentrate exclusively on the business of web design and so Studio 8 will be an important addition to Adobe's existing range of traditional graphics and publishing software.

Dreamweaver, Macromedia's successful web page design program, is still present, as is the ubiquitous Flash and Fireworks web graphics program. To replace Freehand, Macromedia has added Contribute – an easy-to-use web page editor, which can be used to update websites that would have originally been developed by professional designers using Dreamweaver.

Contribute is still in version 3 and hasn't been upgraded along with the rest of the suite. However, the other key programs have all been upgraded to version 8, picking up some key new features along the way.

Flash is one of the best-known Macromedia products, although these days it's more accurate to refer to Flash Basic and Flash Professional. Flash Basic, aimed at designers with a graphics or multimedia background, gains a new Pasteboard that makes it easier to lay out graphics and other elements within a Flash animation. It also gets some new graphics tools for creating complex graduated colours. Flash Professional, aimed at web programmers and application developers, has many new features, in addition to special effects filters that provide more precise control over the movement of animated objects.

The most significant change for both versions is the inclusion of the Flash Video Encoder, which allows you to include compressed video clips within Flash files. You can bet your boots this was another Adobe-influenced decision, as it creates a potential bridge between Adobe's Premiere Pro video editor and Flash, allowing Adobe to get a foot into the web-video market.

Dreamweaver also gets a good selection of new features. There are some general interface improvements, such as redesigned toolbars and palettes to make the program look neater, but it also has improved options for editing tables on web pages. Additionally, you'll have the ability to copy and paste information from Word and Excel documents straight onto a web page without losing any formatting.

But the main emphasis in Dreamweaver 8 is on cascading style sheets (CSS), with many new options to make it easier to view and edit CSS content. The new CSS Tab displays the style rules used on a web page, and makes it easier to select and edit attributes specified by each rule. There are also improved options for checking CSS compatibility with a range of browsers so you can be sure your pages will display correctly in as many as possible.

CSS support has been improved in the Fireworks web graphics program and in the Menu Editor, which simplifies the process of creating pop-up menus and transferring them into either Flash or Dreamweaver. Fireworks also has some impressive new graphics effects, such as perspective shadows and blend modes.

Apart from the loss of Freehand, Studio 8 is a solid, well-planned upgrade. *Cliff Joseph*

Details

Price £821.35 (Upgrade: £351.35)
Best price www.pcw.co.uk/bestprices
Contact Macromedia 0131 458 6766 www.macromedia.com/uk
System requirements 1GHz processor • 1GB Ram • 2GB hard disk • Windows 2000/XP

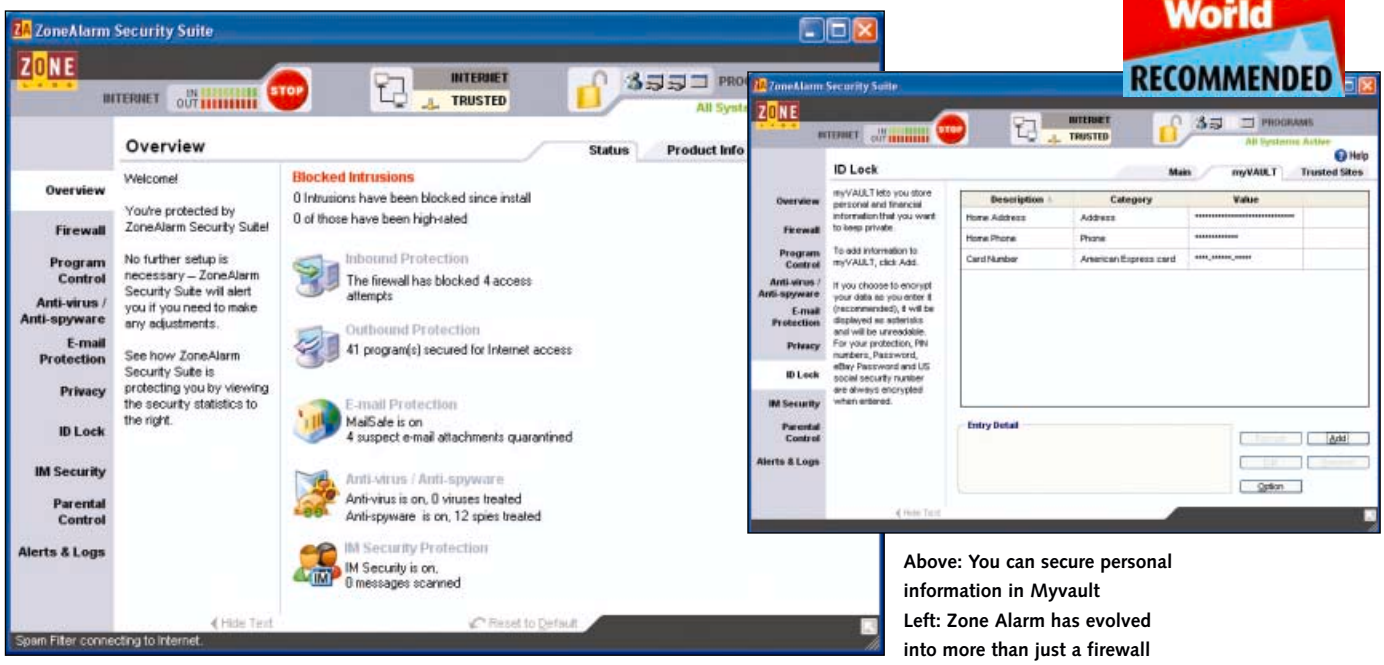
Verdict

Pros Vast range of tools; well designed
Cons Expensive; no more Freehand
Features ★★★★★
Ease of use ★★★☆☆
Value for money ★★★★☆
Overall A strong upgrade that will ensure Studio remains the dominant set of web design and development tools
★★★★☆

SECURITY SUITE

Zone Alarm Internet Security 6.0

Hackers, spyware and viruses can't escape this comprehensive package



Above: You can secure personal information in Myvault
Left: Zone Alarm has evolved into more than just a firewall

Zone Alarm started life as a fairly conventional firewall program, designed to protect PCs from the threat of hackers over the Internet. During the past few years, however, the spread of viruses has become an even bigger threat. As a result, Zone Alarm has evolved into what is now the Zone Alarm Internet Security Suite 6.0 – a comprehensive package combining a firewall with anti-virus, anti-spyware capabilities and other security features.

The firewall is still the core of the suite. Now, as well as monitoring attempts to gain access to your computer through an Internet connection, the firewall will monitor each program installed on your PC to make sure running applications can't be modified or interfered with – such as downloading some spyware onto your PC through a file-sharing program. It can also monitor your Windows Registry to prevent unwanted items being added.

The firewall works automatically most of the time, so you don't need to be a technical expert to install and use it properly. Installation is straightforward, marred only by an annoying registration process and customer survey request when you launch the program.

Once that's done, the Configuration Wizard guides you through the suite's main features, explaining options such as virus and spyware protection, the junk mail filter and pop-up blocker. You are then asked to specify a security level for your PC.

If you're on a home or office network you can tell Zone Alarm that you're in a Trusted Zone, in which case it will allow you to share files and printers with other users. If you're in a less secure environment, you can limit network traffic to just the Internet Zone. This will allow you to connect to the Internet, but prevents other computer users from gaining access to your PC.

During testing we found that, if anything, Zone Alarm worked a little too well, as we kept seeing warnings flashing on screen whenever ordinary programs, such as games or messaging software, attempted to connect to the Internet. However, you can tell Zone Alarm which programs are trusted and should be allowed to continue.

For more precise control you can enter the Zone Alarm control panel, which provides additional settings, including those for the firewall, virus and spyware protection. Each set of controls is divided into basic and advanced sections. The basic controls allow you to select predefined protection settings. Alternatively, you can create your own custom settings. Virus and spyware scans can be scheduled, spam filter settings modified and parental controls set. You can also block access to specific network ports on the PC. The basic settings are fine for most users. The program performed well during our tests, picking up some worrying spyware that had escaped other security software.

There are a few omissions, though. The parental controls are limited and options such as the Smart Filtering aren't explained particularly well. However, this aspect of the suite is secondary to its main purpose, which is to protect you from hackers, viruses and spyware. On that score, Zone Alarm Internet Security Suite gets a thumbs up and, at just under £50, it provides a comprehensive set of security features at a competitive price. Just remember that, like most anti-virus programs, you must renew your Zone Alarm licence after one year (£19.95 per year) in order to continue receiving the latest updates. *Cliff Joseph*

Details

Price £49.95
Best price www.pcw.co.uk/bestprices
Contact Zonelabs 0800 289 041 www.zonelabs.com
System requirements 450MHz processor • 64MB Ram • 50MB hard disk • Windows 98SE/2000/ME/XP

Verdict

Pros Easy to use; comes with a good range of tools
Cons Limited parental controls and content filtering

Features ★★★★☆
Ease of use ★★★★☆
Value for money ★★★★☆

Overall Comprehensive and effective security suite, at a reasonable price

★★★★☆

DETAILS WERE NEVER SO PURE

"...for home multimedia, this is arguably the finest monitor we've ever seen."

"extraordinary image quality..."

PC Plus Performance Award, issue 221 PC Plus

F773 & F773

dvi digital visual interface

> Neon Life Visual Technology
- Vivid Colours
- Sharp Details
- True Picture

> Slim and Innovative Design
> High Brightness Panel
> Fast Response Time

CTX

COMMITTED TO XCELLENCE

SEE MORE DETAILS

www.ctxeurope.com

> CRT DISPLAYS > PROJECTORS > LCD DISPLAYS > PLASMA SCREENS

© 2004 CTX Netherlands B.V. All rights reserved. Specifications are subject to change without notice.

Size Communication

DATABASE MANAGEMENT

Filemaker Pro 8

Sorting, searching and sharing made easier

Personal Computer World BUSINESS RECOMMENDED

Filemaker Pro 8 is the latest release of this popular database management system (DBMS). It's one of the few viable alternatives to Microsoft's Access and its user-friendly approach has won it many friends in the home and small business arenas. Usability has again been improved in this release, but other areas where significant changes are apparent are searching, sorting and data sharing.

Apart from the standard Filemaker Pro 8, several allied products are also available. For more seasoned database users, the Advanced version has extra features for programmers engaged in the development and customisation of databases. Filemaker Server 8 allows file sharing by workgroup; and Server Advanced adds the ability to publish on the web. The Filemaker Mobile 8 package lets you transfer and update data between Filemaker databases and Windows Mobile or Palm OS-based PDAs.

In Filemaker Pro 8, the task of importing a table has been radically improved. In earlier versions, users had to create a table structure before importing, but this step can be omitted as Filemaker will now create the table automatically.

The new Fast Match feature is also very easy to use. With your cursor on a field, or with part of a field highlighted, the Find Matching Record tool will hunt down all matches to the selected field or field portion.

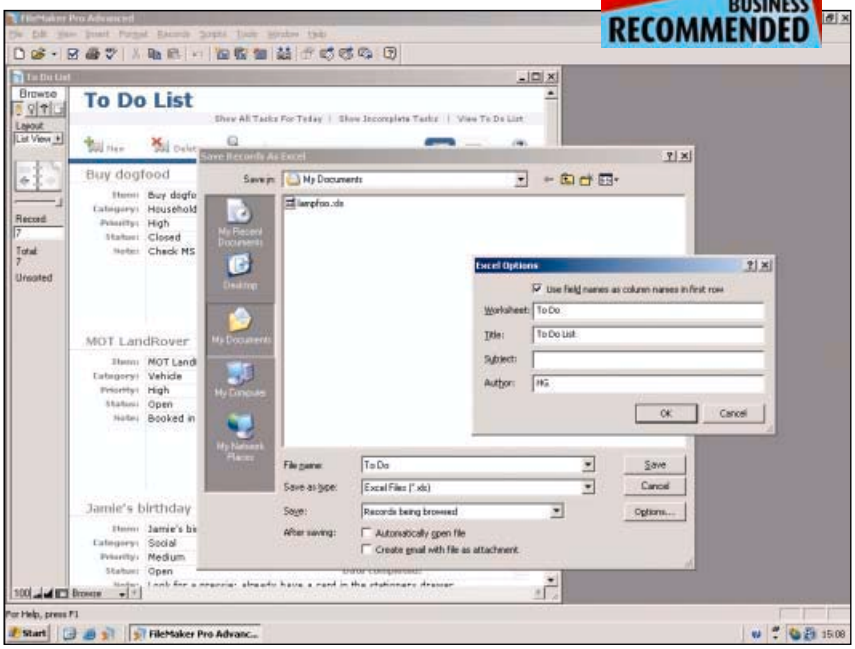
Users who share data using Excel and Adobe pdf worksheets will be pleased to hear that exporting databases in these formats is quick and simple. All you need to do is go to the Save As option and select either the Excel or pdf option.

The Relationships Graph is much more helpful than before. You can see joins between those tables with the same source table, as well as groups of related tables. Notes can also be added to the Relationship Graph so you can document the database structure and any experimental changes.

Existing users will welcome additional ease-of-use improvements, although these are long overdue – Access, in comparison, has offered all these features for more than five years. The Layout Alignment Tools make designing databases far quicker. Alignment options can be applied to a group of selected objects by clicking Arrange on the menu bar, Align and the required alignment type. You also get a dropdown calendar tool and a control for including a tabbed area to a layout.

Impressively, Filemaker Pro 8 runs under both Windows and Mac operating systems. For users in a cross-platform environment, this is clearly a major advantage.

The Advanced version of Filemaker Pro 8 goes much further than the standard edition and offers more tools for developers. Interface design improvements include the ability to customise menus. These can now be built to suit each database application by adding, deleting or renaming menu items or entire menus. As in earlier versions, the menu options can have scripts attached to perform specific actions. Furthermore, keyboard shortcuts can now be customised to ensure they trigger exactly the same behaviour as the menu selections.



Saving database records in Excel format is straightforward in this version of Filemaker Pro

Tooltips, which give a brief message to users guiding them on the type of data entry required, provide developers with another form of customisation to exploit. The tip appears when the mouse hovers over the Tooltip object.

The Database Design Report (DDR) is now much more helpful, giving details of potential problem areas such as missing references and relationships that don't work.

Enhancements to the Script Debugger also help identify problem areas and a new ability to disable script steps is a useful tool in the debugging armoury. Similarly helpful is the Data Viewer that lets you monitor fields, variables and expressions during debugging sessions.

It's also easier for developers to work in a modular fashion using the Re-use feature, which lets you duplicate fields, tables, scripts and script steps. These can be copied and pasted within or between tables, as well as imported.

This latest version of Filemaker Pro makes some important improvements to an already popular package. It's reasonably user friendly, although you'll need some background database knowledge, and it houses a good selection of tools. *Mark Whitehorn*

Details

Price £257, upgrade £138; advanced version £455, upgrade £368
Best price www.pcw.co.uk/bestprices
Contact 01628 534 158
www.filemaker.co.uk
System requirements
Windows: 500MHz Pentium III • 256MB Ram • Windows 2000 (SP4)/Windows XP (SP2)
Mac: PowerPC G3/G4/G5 • 256MB Ram • Mac OSX 10.3.9 or 10.4

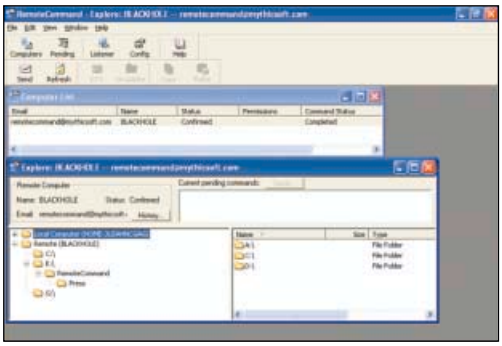
Verdict

Pros User friendly; good developer tools
Cons Some new features are old hat to Access users
Features ★★★★☆
Ease of use ★★★★☆
Value for money ★★★★☆
Overall A large step towards making a deservedly popular DBMS more user friendly and professional
★★★★☆

REMOTE ACCESS

Mythicsoft Remote Command

A simple and effective file transfer utility



If you like the sound of MywebexPC (see below), but are after something a little simpler to use, Remote Command from Mythicsoft might be of interest. It offers complete access to files and emails on a remote computer. What it doesn't do is replicate the desktop, such as in GotomyPC and MywebexPC. Instead, communication between the two computers is handled through email. It's also possible to send Dos commands, which provide the ability to start and stop programs on the remote PC.

Remote Command software must be installed on both computers, and each PC must have an email address for file transfers. Licensing is on a per user basis, so it can be installed on several computers.

After installation, encryption keys are exchanged between the two computers. During this process, it's possible to limit the amount of access the other computer will have, which is useful for giving read-only file access without permission to execute Dos commands.

Unlike most other remote access utilities, if the other PC is offline you can still queue up file transfers. As soon as the second PC reconnects to the Internet, the files will be emailed over.

There are some drawbacks to this system. Since a working connection to an SMTP server is required, mobile users may come across problems, depending on the settings of the network they're using and what sort of access is allowed to their SMTP server. As files are transferred using email, a sizeable inbox will also be required when exchanging large files.

Remote Command is good for regular communication between two locations and is more secure than browser-based equivalents, but functionality is limited as a result. *Tim Smith*

Details

Price £30
Best price www.pcw.co.uk/bestprices
Contact Mythicsoft
www.mythicsoft.com
System requirements 486 processor • 32MB Ram • 10MB available hard disk space • Pop/SMTP email account or Mapi/SMapi client • Windows 2000/XP/SP2/2003

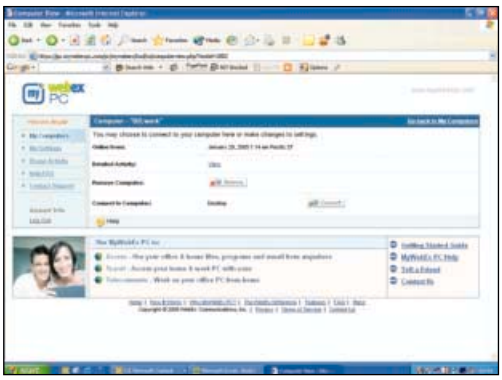
Verdict

Pros Secure transfer of files
Cons Software must be on both PCs; limited functionality
Features ★★☆☆☆
Ease of use ★★★☆☆
Value for money ★★☆☆☆
Overall Simple and effective file transfer system, but limited compared with realtime equivalents
★★★☆☆

REMOTE ACCESS

Webex MywebexPC

Access your PC from afar for free



With more and more homes across the country using a broadband Internet connection, remote access software is proving to be big business. Remote access allows you to control a PC over the Internet. The entire desktop appears in a window and you can check emails, run applications and even access local networks, just as you would if you were sitting in front of the PC.

An alternative to the well-respected GotomyPC, MywebexPC has the added advantage that the personal version is available free. However, it only allows one copy of the client software to be installed.

The Pro version, which costs $10 (approximately £5.50) per month, allows installation on up to 10 PCs. MywebexPC Pro also includes a file transfer utility. Both versions have security features, such as the ability to blank the screen and disable the mouse and keyboard of the remote computer when connected.

Remote access must originate from a computer using Windows in conjunction with Internet Explorer or Mozilla Firefox. This restriction is a shame since GotomyPC will happily work with any browser, as well as being compatible with both Mac and Linux systems. To ensure a secure connection, all information passed between the two computers is encrypted.

If you're particularly worried about the security side of things, you can restrict the access your remote computer has to certain programs; for example, an email client or Word.

The free MywebexPC will obviously appeal to those wanting a simple remote access utility, but to get similar features to GotomyPC you'll need to opt for the paid-for version. *Tim Smith*

Details

Price Personal, free; Pro $10 per month (approx £5.50)
Best price www.pcw.co.uk/bestprices
Contact Webex Communications
0800 389 9772
www.mywebexpc.com
System requirements Windows • Internet Explorer or Mozilla Firefox • Internet connection

Verdict

Pros Free realtime remote access
Cons Windows only; multiple PCs require Pro version
Features ★★★☆☆
Ease of use ★★★★☆
Value for money ★★★★☆
Overall Free remote access, but only works with Windows and selected browsers
★★★★☆

Google Talk (Beta)

Price Free **Contact** www.google.com/talk **Overall** ★★★☆☆

In its latest attempt to take over everything Internet, Google has launched an instant messaging and VoIP (Voice over IP) service.

Still in its beta version, the interface is incredibly simple. No smilies, avatars or file transfers. All you get is an address book and the option of either a text or voice conversation. Voice quality was about average for a VoIP service.

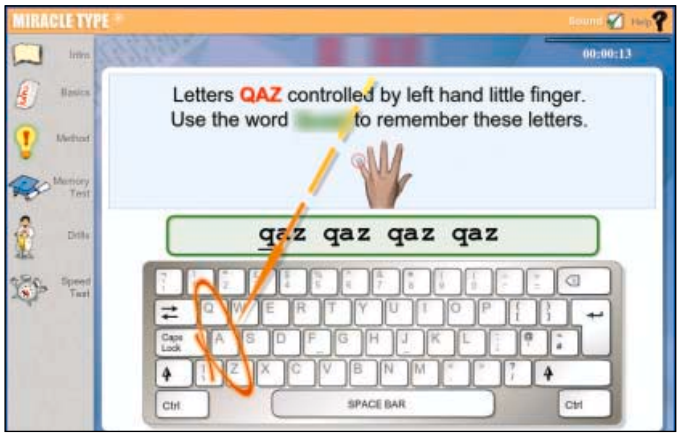
To use Google Talk, you'll need a Gmail account (also in beta), and the only way to get a Gmail account is to be invited by a current Gmail user. When both services are fully released, we'll bring you a more in-depth review. As it stands, Google Talk has its work cut out with established services, such as Skype, already boasting huge user bases. *Will Stapley*

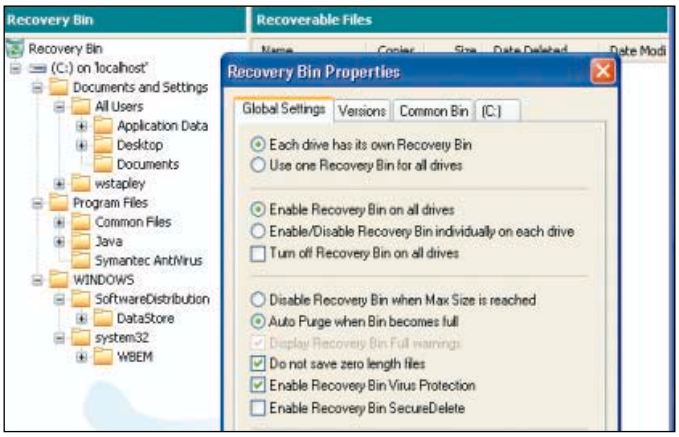
Miracle Type

Price £23.49 **Contact** www.miracletype.com **Overall** ★★★★☆

If you're still bashing in words on your keyboard using just two fingers, it's time to learn to touch type. Miracle Type uses memory aids and phonetics to help you remember where each letter resides on the keyboard.

All you need to learn is five words per hand, with each word relating to a vertical group of keys. For example, you remember the word 'quazi' for the little finger on your left hand – this signifies the Q, A and Z keys, which are all accessed by that finger. Full voice instructions are included and, once you're done with the basics, there are speed tests and drills to help you type faster and more accurately. It's a little pricey, but Miracle Type is easy to use and a great way to learn touch typing. *Anna Lagerkvist*





Undelete 5

Price £35 **Contact** www.undeleteeurope.com **Overall** ★★★☆☆

The pain of deleting a file accidentally and then not being able to retrieve it is all too common among Windows users. XP's Recycle Bin helps out to a certain extent, but it occasionally rejects files if they're too big, and can miss files deleted automatically by third-party programs.

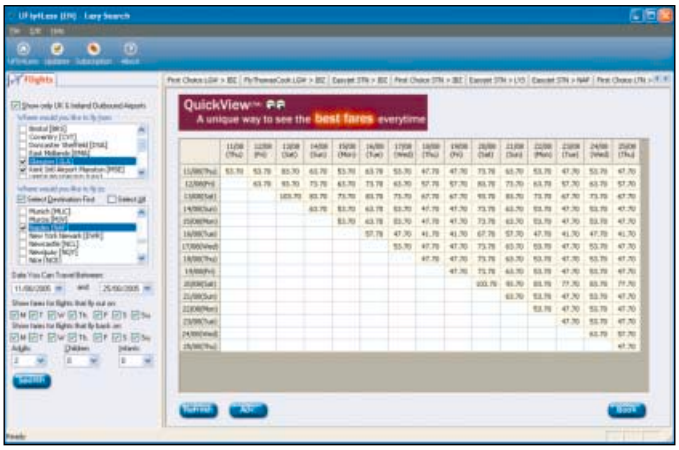
Undelete 5 attempts to help you out by replacing the Recycle Bin altogether. Once installed, any deleted file will be sent directly to Undelete's Recovery Bin. All purged files can then be accessed and restored using a Windows Explorer-style interface. Usefully, the Recovery Bin will also help you restore previous versions of Microsoft Office files. At £35, it's pricey, but if saves you losing a vital file, it's worth it. *Rory Reid*

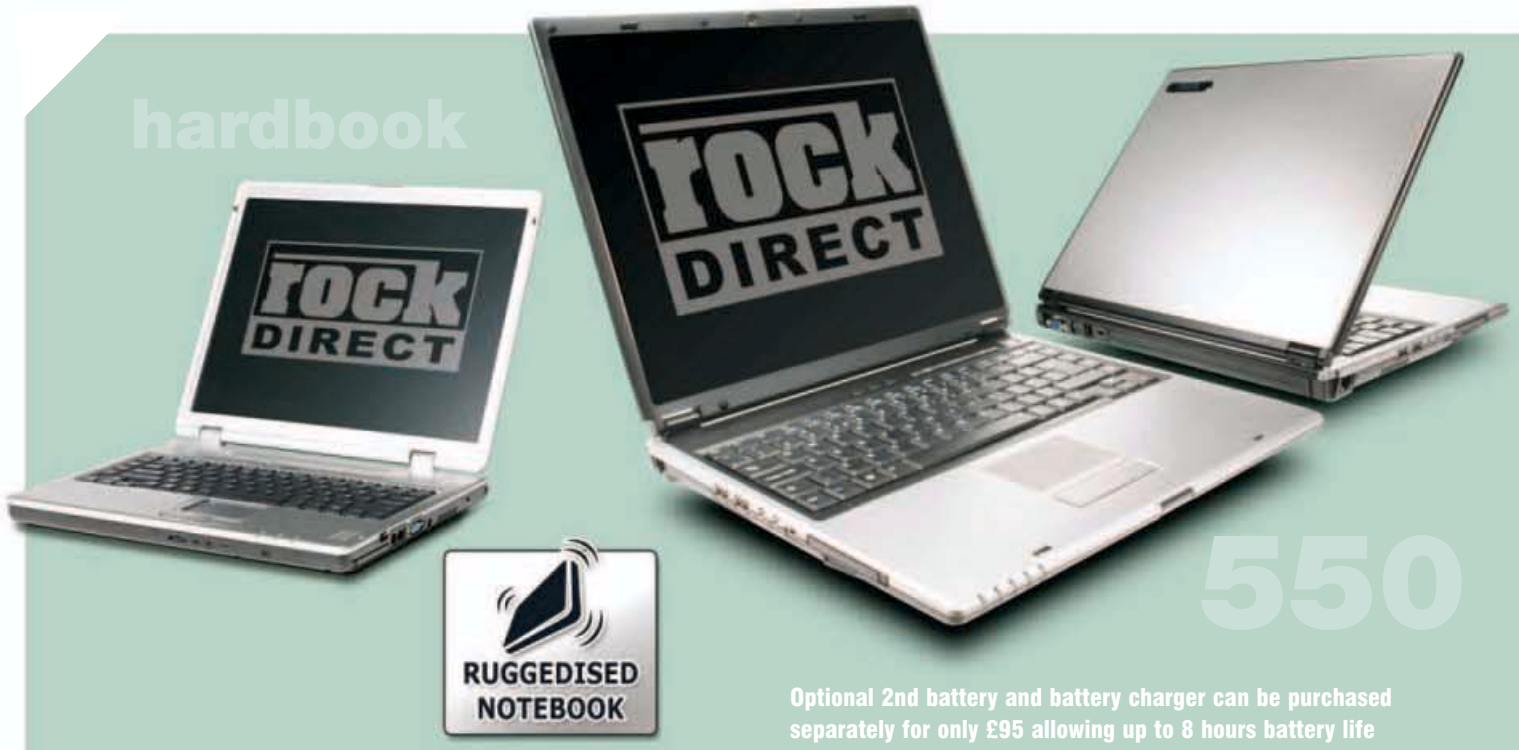
Ufly4less

Price £25/year **Contact** www.ufly4less.com **Overall:** ★★★★☆

Ufly4less is too useful a tool to ignore, especially if you're a frequent flyer. By searching flight details of the UK's 13 low-cost airlines, it aims to save you money each time you fly. Enter a destination, travel dates and number of seats, and Ufly4less will hunt down the best deals.

Of course, free online searches such as Skyscanner (www.skyscanner.co.uk) are available, but we found the desktop-based Ufly4less easier to use. The database is updated constantly, so you can be sure you're getting the cheapest flights, and a full search takes just 10 seconds. Direct links to the airlines are also provided for quick bookings via their websites. *Will Stapley*





Optional 2nd battery and battery charger can be purchased separately for only £95 allowing up to 8 hours battery life

Hardbook

MAIN FEATURES

Up to Intel® Pentium® M770 Processor 2.13GHz
– Featuring Intel® Centrino™ Mobile Technology
– Up to 2Mb Level 2 Cache
15" SXGA+ TFT Screen (1400 x 1050 Res)
9 Cell Battery • Intel® Pro 802.11a/b/g Integrated Wireless LAN
Intel® Graphics Media Accelerator 900
Dual Layer DVD Writer
Up to 120Gb Ultra DMA-100 Hard Drive
1 x IEEE1394 Firewire™ • 3 x USB 2.0
Microsoft® Windows® XP Home • Roxio Creator™ 7 • Napster™ (1 month subscription) • Microsoft® Works 8 and Microsoft® Office 2003 (60 day trial)
3 Year C&R Parts and Labour Warranty
330(W) x 297(D) x 40(H)mm & 3.2kg
Full specification online

Pegasus 550

MAIN FEATURES

Up to Intel® Pentium® M750 Processor 1.86GHz
– Featuring Intel® Centrino™ Mobile Technology
– Up to 2Mb Level 2 Cache
15" XGA TFT Screen (1024 x 768 Res)
6 Cell Battery • Intel® Pro 802.11a/b/g Integrated Wireless LAN
Intel® Graphics Media Accelerator 900
Dual Layer DVD Writer
Up to 120Gb Ultra DMA-100 Hard Drive
1 x IEEE1394 Firewire™ • 4 x USB 2.0
Microsoft® Windows® XP Home • Roxio Creator™ 7 • Napster™ (1 month subscription) • Microsoft® Works 8 and Microsoft® Office 2003 (60 day trial)
3 Year C&R Parts and Labour Warranty
333(W) x 276(D) x 33(H)mm & 2.5kg
Full specification online

MODEL: HB-C1.4

- Intel Celeron M 360 1.4GHz
- 15.1" SXGA+ TFT Screen
- 512MB DDR 400Mhz RAM
- 60Gb HDD
- DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN
- 6 Cell Battery

£849 £997.58 Inc VAT

MODEL: HB-1.73

- Intel Pentium M 740 1.73GHz
  Featuring Intel Centrino Technology
- 15.1" SXGA+ TFT Screen
- 512MB DDR 400Mhz RAM
- 60Gb HDD • DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN
- 6 Cell Battery

£999 £1173.83 Inc VAT

MODEL: P550-C1.4

- Intel Celeron M 360 1.4GHz
- 15" XGA TFT Screen
- 256MB DDR2 533Mhz RAM
- 60Gb HDD • DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN
- Built in Video Camera
- 6 Cell 'Hot Swappable' Battery [up to 4 hrs]

£599 £703.83 Inc VAT

MODEL: P550-1.73

- Intel Pentium M 740 1.73GHz
  Featuring Intel Centrino Technology
- 15" XGA TFT Screen
- 256MB DDR2 533Mhz RAM
- 60Gb HDD • DVD Writer • Built in Video Camera
- Intel Pro 802.11a/b/g Integrated Wireless LAN
- 6 Cell 'Hot Swappable' Battery [up to 4 hrs]

£649 £762.58 Inc VAT

MODEL: P550-1.86

- Intel Pentium M 750 1.86GHz
  Featuring Intel Centrino Technology
- 15" XGA TFT Screen
- 512MB DDR2 533Mhz RAM
- 60Gb HDD • DVD Writer • Built in Video Camera
- Intel Pro 802.11a/b/g Integrated Wireless LAN
- 6 Cell 'Hot Swappable' Battery [up to 4 hrs]

£699 £821.33 Inc VAT

3 Year Collect & Return Warranty

Every rock brand notebook comes as standard with a 3 year collect and return warranty covering both parts and labour. If your notebook breaks down in the first three years of ownership, we'll collect, repair then return it free of charge. Plus this cover is insurance backed by a third party giving you peace of mind that your warranty will be honoured in an often uncertain world.

Roxio Creator™ 7 is the all-in-one solution for your digital media. Includes complete, fully integrated applications; Easy CD&DVD™, PhotoSuite® 7 and VideoWave® 7. (Supplied as OEM version.)

rock DIRECT

available colours:

DIABLO RED

ESTORIL BLUE

CHAMELEON
(please add £50 + VAT)

BAD BOY BLACK
HI GLOSS

PINK

Ti

650

more power, more punch, total gaming, greater performance, portable business... no contest

Pegasus Ti

MAIN FEATURES

Up to Intel® Pentium® M Processor 765
– Featuring Intel® Centrino™ Mobile Technology
– 2Mb Level 2 Cache
128Mb ATI Mobility Radeon 9700 Graphics
15.4" High Definition WXGA TFT Screen (1260 x 800 Res)
Intel® Pro 802.11a/b/g Integrated Wireless LAN
8x Dual Layer Multi-Format DVD Writer • 1 x IEEE1394 Firewire™ • 3 x USB 2.0 Ports
Available Colours: Diablo Red, Estoril Blue Metallic, Chameleon Metallic, Bad Boy Black Hi Gloss, Pink
Microsoft® Windows® XP Home • Roxio Creator™ 7 • Napster™ (1 month subscription)
Microsoft® Works 8 and Microsoft® Office 2003 (60 day trial)
3 Year C&R Parts and Labour Warranty
354(W) x 250(D) x 28(H)mm & 3.1kg
Full specification online

Pegasus 650

MAIN FEATURES

Up to Intel® Pentium® M Processor 780
– Featuring Intel® Centrino™ Mobile Technology
– 2MB Level 2 Cache
128MB ATI Mobility Radeon X700 Graphics on PCI-Express bus
15.4" High Definition WSXGA+ TFT Screen (1680 X 1050 Res)
Intel Pro 802.11a/b/g Integrated Wireless LAN
8x Dual Layer Multi-Format DVD Writer • 1 x IEEE1394 Firewire™ • 3 x USB 2.0 Ports
Available Colours: Diablo Red, Estoril Blue Metallic, Chameleon Metallic, Bad Boy Black Hi Gloss, Pink
Microsoft® Windows® XP Home • Roxio Creator™ 7 • Napster™ (1 month subscription)
Microsoft® Works 8 and Microsoft® Office 2003 (60 day trial)
3 Year C&R Parts and Labour Warranty
358(W) x 270(D) x 45(H)mm & 3kg
Full specification online

MODEL: PTI-1.8

- Intel Pentium M 745 1.8GHz *Featuring Intel Centrino Technology*
- 15.4" WXGA TFT Screen
- 512MB DDR 333 RAM
- 60Gb HDD
- 8x Dual Layer DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN

£799 £938.83 Inc VAT

MODEL: PTI-2.0

- Intel Pentium M 755 2.0GHz *Featuring Intel Centrino Technology*
- 15.4" WXGA TFT Screen
- 1GB DDR 333 RAM
- 60Gb 5400rpm HDD
- 8x Dual Layer DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN

£899 £1056.33 Inc VAT

MODEL: P650-1.86

- Intel Pentium M 750 1.86GHz *Featuring Intel Centrino Technology*
- 15.4" WXGA TFT Screen
- 512GB DDR2 533Mhz RAM
- 80Gb 5400rpm HDD
- 8x Dual Layer DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN

£999 £1173.83 Inc VAT

MODEL: P650-2.0

- Intel Pentium M 760 2.0GHz *Featuring Intel Centrino Technology*
- 15.4" WXGA TFT Screen
- 1GB DDR2 533Mhz RAM
- 80Gb 5400rpm HDD
- 8x Dual Layer DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN

£1099 £1297.33 Inc VAT

MODEL: PTI-2.1

- Intel Pentium M 765 2.1GHz *Featuring Intel Centrino Technology*
- 15.4" WXGA TFT Screen
- 1GB DDR 333 RAM
- 60Gb 5400rpm HDD
- 8x Dual Layer DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN

£999 £1173.83 Inc VAT

Pegasus Ti OPTIONS
Windows® XP Pro • 9 Cell Battery

MODEL: P650-2.13

- Intel Pentium M 770 2.13GHz *Featuring Intel Centrino Technology*
- 15.4" WXGA TFT Screen
- 1GB DDR2 533Mhz RAM
- 100Gb 5400rpm HDD
- 8x Dual Layer DVD Writer
- Intel Pro 802.11a/b/g Integrated Wireless LAN

£1199 £1408.83 Inc VAT

intel inside
centrino™
MOBILE TECHNOLOGY

call **08709 90 90 90**
www.**rockdirect.com**
email **sales@rockdirect.com** fax **0871 8550 888**

FIRST-PERSON SHOOTER

Chrome Specforce

Become a highly trained soldier of the future

Above: If in doubt, shoot anything that moves

Right: A variety of 'power-ups' add to the gameplay

Chrome is the sequel to the 2003 first-person shooter Specforce. Like its predecessor, the game asks players to assume a role in the Specforce – an elite combat unit tasked with ridding the galaxy of security threats and ensuring the survival of its parent organisation.

Most missions require you to simply shoot anything that moves, but the game is mission-based and progression depends on the completion of set tasks.

The basic mechanics of play will be familiar to most players, but there are a few elements that are intended to help spice things up. As well as the standard weapons (pistols, automatic rifles, shotguns and grenades), you can use various 'power-ups' such as the Neural Booster, which increases player reaction speed by slowing the game down.

Many of these power-ups are more gimmicky than essential, but a few of them add variety to the gameplay. The camouflage layer is particularly impressive, as it makes the player virtually invisible to the opposition. Its effects are wasted if you start firing or move around too quickly, but the ability to sneak past guards in heavily fortified areas is welcome.

The original Chrome involved a lot of solitary shooting, but in Specforce the emphasis is more on teamwork. Working with a group of computer-controlled soldiers gives you plenty of additional firepower, so you won't have to do all the work yourself.

The artificial intelligence (AI) is generally quite impressive, but there are occasions when it forces the computer-controlled squad members into dangerous firing positions, with the result that you need to rescue them. Futuristic first-person shooters often seem unrealistic and Specforce is no different. Eliminating opponents in games such as Call of Duty is very satisfying, but in Chrome, even frantic battles can be rather impersonal. One of the major causes of this was the toy-like sound effects of weapons. We were also disappointed with the 'hacking' system for opening new doors. Gaining access to some new areas requires players to match pairs of icons in a tedious mini-game that is a hindrance to the pace of the action.

Some gamers may also have an issue with the game's unusual inventory system. This requires you to manually fit weapons and other items into a virtual backpack by dragging and dropping their respective icons onto a rectangular grid. We're not opposed to characters that can't carry an unlimited supply of equipment, but having to manually rearrange the position of individual items is about as much fun as packing for a real-life trip.

While generally good, the graphics aren't that far removed from the original game, and textures can look rather muddy and repetitive in places. These gripes aside, you can have a lot of fun with Specforce.

The original game had a variety of usable vehicles, and that's also the case here. There are five transport options on offer, including anti-gravity speeders and mechanised walkers. There's also a 32-player deathmatch option, although it isn't as sophisticated as those in Battlefield or Unreal Tournament 2005. There are six maps available, each supporting death match, team domination, team death match, and capture the flag play modes. You can also create your own levels with the 'Chromed' map editor. Chrome doesn't live up to the standards set by more high-profile titles such as Half-Life 2, but if you're a fan of futuristic first-person shooters, it is certainly worth considering. *Rory Reid*

Details

Price £19.99
Best price www.pcw.co.uk/bestprices
Contact Deep Silver
www.deepsilver.de
System requirements 700MHz processor • 256MB Ram • 1.8GB hard disk • Windows 98SE/2000/ME/XP

Verdict

Overall **Good blasting action, but not as immersive as some of its rivals**

★★★☆☆

ARCADE

Big Mutha Truckers 2: Truck Me Harder

The redneck race is on to save Big Ma from a jury's wrath

It's not surprising there aren't many games about trucking. Hauling cattle across thousands of miles of motorway isn't particularly glamorous.

What better way to spice up a trucking game then, than to inject some redneck humour and give it one of the most puerile titles in the history of gaming. Before you call Watchdog, there is some logic to the game's unusual moniker. 'Big Mutha Truckers Hauling Inc' is a trucking firm owned by Big Ma, whose shady business dealings have led to her arrest for tax evasion. It's up to you, as one of her four children, to 'truck' as feverishly as possible in order to raise money for a fancy talkin' lawyer and to pay off corrupt jurors in her trial. This can be done by repeatedly purchasing goods from one location, driving them to another, and selling them on for profit. Bonuses are awarded for speed, damaging other vehicles, picking up hitchhikers, and avoiding that most pertinent of redneck threats; alien abduction.

Initially, the game is a lot of fun. Ramming other drivers off the road and stealing cargo is enjoyable, and the feel and handling of the trucks is satisfying. The graphics are very well done, and the sounds offer a good dose of humour. You get a good level of freedom with the choice of available routes, and the inclusion of mini-games in the virtual casino. Eventually though, the redneck jibes wear thin, so you may get bored with it sooner rather than later. There are a number of bonus missions that require you to drive other vehicles, such as an ambulance, but most of the time you are stuck in your rig. Truck Me Harder won't give you the same satisfaction as GTA: San Andreas, but if you're after a quick trucking session that requires little emotional investment, it may be your cup of tea. *Rory Reid*

Details

Price £19.99
Best price www.pcw.co.uk/bestprices
Contact Empire Interactive
www.empireinteractive.co.uk
System requirements 2.4GHz processor • 256MB Ram • Windows 98SE/2000/ME/XP • 32MB video card with Transform & Lighting

Verdict

Overall **Good clean trucking fun, but it's a trucking shame it isn't more substantial**

★★★☆☆

SIMULATION

ER

Playing doctor at County General may try your patience

There are all manner of simulation games available. Some let you build cities, while others let you dabble in adult relationships, but there are very few that let you play doctor. ER aims to redress this balance by letting you re-enact the popular television show of the same name.

Initially, players must create a doctor and customise their gender and skin colour. Then you'll have to fill out some statistics that determine your competency in cardiology, neurology, general surgery, toxicology, pediatrics and orthopedics. After that, you'll be assigned to triage where patients wander in with all manner of ailments. You can figure out what's wrong with a patient by clicking on them, which causes a diagnosis to appear in the bottom section of the screen, alongside an injury rating that indicates the severity of their condition. If the patient's sickness is beyond your capability, you can assign them to a higher-ranked doctor. If you feel you're up to the task you can assign them to a bed and enlist the help of a nurse. That's where the fun should begin, but it doesn't.

Treating a patient is as simple as clicking on them and hoping their injury rating goes down. If it doesn't, you'll need to send the patient to the lab for additional tests, but when they return, it's back to clicking and hoping yet again.

ER tries to emulate the character interaction elements of the TV show (between doctors only), and tries to inject a dose of humour by introducing unusual patients (we won't spoil the surprise, as there are so few). However, these features are so poorly implemented they feel like something of an afterthought. ER might appeal to very casual gamers with low expectations, but given its very basic gameplay and the lack of drama, fans of the show are bound to be disappointed. *Rory Reid*

Details

Price £19.99
Best price www.pcw.co.uk/bestprices
Contact Mindscape
www.mindscape.co.uk
System requirements 800MHz processor •256MB Ram •2GB hard disk •Windows 98SE/2000/ME/XP •32MB video card with T&L

Verdict

Overall **A promising concept, but the game lacks the qualities of the hit TV show**

★★☆☆☆

Create. Store. Backup. Go.

LaCie USB Hard Drives

- Portable & stackable - only 11.2 x18.8 x3.5cm
- Sleek, robust enclosure - design by F.A. Porsche
- Silent no-fan operation with metal base cooling
- 7200rpm ideal for DV Video or multitrack audio
- FireWire or USB2.0 versions - cables included
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
FireWire - 80GB, 160GB, 200GB, 250GB
USB2.0 - 80GB, 160GB, 200GB, 250GB

NEW!! LaCie Safe Mobile Hard Drives

- Biometric encryption - Fingerprint recognition
- Safely store and transport your private data
- Ultra-portable - only 8 x13.8 x2.5cm & 200g
- USB 2.0 interface - all cables included
- AC adapter-free, powered by USB
- Sleek, robust encloser - designed by F.A. Porsche
- 2 years manufacturer's warranty as standard

Available Models:
40GB, 80GB

LaCie Photon LCD Monitors

- DVI and VGA connectors
- Highest specification LCD monitors, IPS technology
- Photon 20 - resolution 1600x1200
- Photon 20 - response time 16ms
- Photon 20 - dot pitch 0.25
- Photon 20 - 176 degrees viewing angle (IPS)
- 3 years advance replacement warranty

Available Models:
Photon LCD/TFT 19"
Photon LCD/TFT 20.1"

LaCie Triple Interface, FireWire 800/400 & USB2.0 'd2' Hard Drives

- Sleek, aluminium heat dissipating robust case
- 7200rpm ideal for DV Video - silent operation
- Fast FireWire 800 'Extreme' up to 80MB/s sustained
- FW 400, USB2.0 & FW800 (all cables included)
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
160GB, 250GB, 300GB, 400GB, 500GB,
1000GB, 1600GB, 2000GB

LaCie d2 'Lightscribe' Firewire or USB2.0 16x DVD+/-RW's & CD-RW

- Lightscribe direct disk labelling technology
- For professional looking created media
- Double Layer DVD up to 8.5GB capacity
- Dual format DVD+/-RW (and CD-RW)
- Super fast write and re-write speeds
- Bundles Include DVD authoring software
- 2 years manufacturer's warranty as standard

Available Models:
DVD+/-RW 16x4x16x Double layer & CD-RW
CD-RW 52x32x52x

LaCie 300 Series Monitors

- DVI and VGA connectors
- Highest specification Superfine TFT Panel
- 321 - maximum resolution 1600x1200
- 321 - response time 20ms
- 321 - dot pitch 0.27
- 321 - 176 degree viewing angle (S-IPS)
- 3 years advance replacement warranty

Available Models:
321 - 21"
319 - 19"

LaCie USB/FireWire 2.5" MobileDrives

- Ultra-portable - only 7.6 x12.9 x1.7cm & 200g
- USB 2.0 and/or FireWire interface - cables included
- AC adapter-free, powered by USB or FireWire
- Ideal for notebook/laptop users as mobile storage
- Sleek, robust enclosure - design by F.A. Porsche
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
USB2.0 - 40GB, 60GB, 80GB, 100GB
FireWire & USB2.0 - 40GB, 60GB, 80GB, 100GB

LaCie d2 'Ethernet Disk mini' Network Hard Drives and USB 2.0

- Share data across a network by unlimited users
- Easily administered via any web-browser
- Quick and simple installation - no drivers needed
- No server required, NAS hard drive
- Fast ethernet connection or USB2.0 direct attach
- For Windows®, Mac OS®, and Linux
- 2 years manufacturer's warranty as standard

Available Models:
d2' mini NAS & USB2.0 - 250GB, 400GB, 500GB
Ethernet Disk XP embedded - 800GB, 1000GB

LaCie Blue Eye Pro Colour Calibrator

- Automatic hardware calibration
- Creates and activates advanced ICC profiling
- Time saver colour test modukle
- Switchable colourimetic environments
- Designed to complement the LaCie 300 series
- USB interface - all cables and software included
- 2 years manufacturer's warranty as standard

Available Models:
Blue Eye Pro
Blue Eye 2

Please visit www.lacie.com/uk

LaCie products are available from leading resellers - E-mail: info.uk@lacie.com

E&OE July 05

Two cores are better than one

With the boast of much increased speed and performance levels, dual-core PCs are set to shake up the processing world. Rory Reid finds out if the first systems to arrive fulfil their promise

The old maxim 'two heads are better than one' holds true in most circumstances, not least in the world of computing. Dual-core CPUs from AMD and Intel, which have two processors on a single die, are a relatively new phenomenon and offer users improved processing by splitting the workload across multiple CPU cores. We rounded up a collection of the first PCs in the UK using dual-core CPUs to see how they compare, what guises they come in and what benefits they offer users.

Specifically, we wanted to find out what performance improvement dual-core PCs offer over their single-core counterparts, whether any added speed benefits are overshadowed by prohibitive pricing, and if dual-core machines really represent the future of computing.

In order to see a range of PCs, we gave vendors a large amount of freedom in deciding how to equip their submissions for this group test. No minimum or maximum price restrictions were specified, so as well as multimedia behemoths you'll see some real bargains, all of which use a dual-core CPU.

As usual, we subjected them all to stringent *PCW* benchmark tests to see how they fared, and assessed the features and value for money provided by each. Turn the page to see which dual-core PC is right for you.

ON TEST

72 **Chillblast Fusion X2 4400 GTX Cube 24/7 Aurora**
75 **Evesham Axis Decimator GT X2 Intellect Prodesk A64x2/4400+**
76 **Medion Pentium D 2.8GHz Mesh Titan PCW**
77 **PC Nextday Zoostorm 4400+ Dual Core PC**

77 Why dual-core?
80 Features table
82 Lab results
Editor's Choice

'We want to find out if dual-core machines really represent the future of computing'

Chillblast Fusion X2 4400 GTX

Price £1,749.99 **Contact** www.chillblast.com

This PC's Lian Li PC-V1000 case looks startlingly similar to that of an Apple Power Mac G5. It is arguably the most attractive case here, but Chillblast's reasons for selecting it are not merely cosmetic. The company believes the case has a better build quality and offers superior ventilation to any other it has used in the past. We were unable to verify these claims, but the inclusion of a Vapochill Micro ultra-low noise CPU cooler, 120mm Akasa Amber front fan and a user-controlled exhaust fan meant this PC was one of the coolest-running and quietest submissions.

Like the Mesh Titan PCW, the Fusion X2 uses the excellent Asus A8N SLI Deluxe motherboard, which offers high performance, onboard eight-channel audio and SLI (Scalable Link Interface) graphics support. Given Chillblast's penchant for high-performance PCs, we were surprised it paired the motherboard with an AMD Athlon 64 X2 4400+ processor, which has a lower clock speed than the X2 4600+ favoured by Evesham and Mesh. However, this CPU has 1MB more cache memory, which makes it faster when it comes to using office and video-editing applications and so on. The PC's operating system is installed on a Western Digital Raptor hard drive with a fast spin speed of 10,000rpm. As a result, the Fusion X2 runs noticeably quicker than most of its rivals.

Like most of the group, this PC uses an Nvidia Geforce 7800GTX graphics card. However, this is the only submission that makes the most of its extreme performance, by including a 20in monitor. Whereas the 17 and 19in panels elsewhere are restricted to a resolution of just 1,280 x 1,024, the Chillblast will run games at an impressive 1,600 x 1,200.

The Fusion X2 is hard to fault. It is well configured, runs quickly and looks the part. It is a little expensive (the Dinovo keyboard and mouse are luxury items), but it thoroughly deserves our Editor's Choice award.

Personal Computer World EDITOR'S CHOICE

Verdict

Pros Great case; performance; 20in screen

Cons You'll need to dig deep to buy one

Features ★★★★☆

Performance ★★★★★

Value for money ★★★★★

Overall Not the fastest but makes the most of its potential in almost every way

★★★★☆

The Vapochill is quieter than the recommended standard AMD cooler

Cube 24/7 Aurora

Price £1,599 **Contact** www.cube247.co.uk

Cube 24/7 made a splash in last month's issue with its multi-display Taurus PC. The Aurora ditches the three-screen approach, however, in favour of a more traditional setup.

As before, Cube uses a relatively unknown brand of monitor. The GNR TS900H looks inoffensive, is height adjustable and has a fairly quick 16ms response time. However, while its display quality is of a good standard, it uses an analogue D-Sub connector instead of the more modern digital DVI-I type. This means you may have to occasionally use the auto-calibration button as the analogue signal becomes desynchronised.

Inside the rather uninspiring base unit is an Abit AN8 Ultra motherboard. This is not the gaming-oriented Fatal1ty edition that won an award in our October issue, but it has almost exactly the same features, with the exception of a passive chipset cooler that aids its quiet operation.

The Aurora uses an Athlon 64 X2 4400+ CPU. It also has 1GB of DDR400 memory from performance memory specialist Corsair, although this combination failed to produce as impressive a benchmark result as the Chillblast PC. This was mostly due to the Chillblast's faster hard drive configuration, but the Aurora has 126GB more disk storage space. Multimedia file hoarders should keep this in mind and note the inclusion of the very capable Creative Labs Inspire T7900 speakers.

The Aurora is one of three PCs in this group that uses an ATI graphics card. Its Radeon X850 XT is an excellent card that can handle any game with aplomb, but it is not as good as the Nvidia Geforce 7800GTX cards seen elsewhere.

Cube 24/7 has once again supplied a very capable PC. It is not the best example here, but it is worth consideration.

Verdict

Pros Hard drive space; speakers

Cons Analogue input monitor; average performance

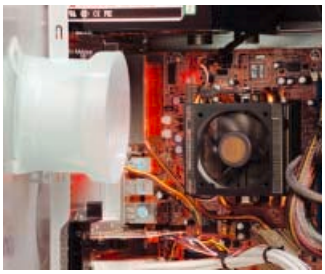
Features ★★★☆☆

Performance ★★★☆☆

Value for money ★★★☆☆

Overall A capable all-rounder with lots of storage, but it's outclassed by its rivals

★★★☆☆



This heatsink funnel channels air directly outside the case ↘

>> Visit the new PCW Direct website

PERSONAL COMPUTER WORLD Direct >>

Products selected just for you

Get amazing deals on:

- Digital cameras from £100
- Software including utilities, security and imaging packages
- Inkjet photo printers
- Back issue CD-ROM's
- And many more products selected just for you...

Find great deals for all your computing needs!

Visit www.direct-pcw.co.uk today >>

ORDER ONLINE NOW!

http://www.computeractive-direct.co.uk
or order by calling: 01858 438883
(please quote code Z180)

Evesham Axis Decimator GT X2

Price £1,599 **Contact** www.evesham.com

The Decimator GT X2 joins the Mesh Titan PCW in its use of an AMD Athlon X2 4600+ processor – the highest-rated CPU in the group. In delivering a PC with such a high-end processor, Evesham has compromised on certain components.

The GT X2's 200GB Western Digital drive provides the least amount of storage in the group. By comparison, the budget Zoostorm 4400+ from PC Nextday has a 250GB drive. Evesham has not used the imposing aluminium case seen on most Decimator PCs, but has gone for a more mundane ATX offering.

Happily, the rest of the specification is up to par. There is 1GB of DDR400 memory and the latest graphics card – an Nvidia Geforce 7800GTX. As is often the case, Evesham has erred on the side of caution by supplying a 19in monitor. The Viewsonic VX924 is an excellent screen in many respects, and its 4ms response time makes it perfectly suited to gamers. But, as is typical of 19in TFTs, its resolution of 1,280 x 1,024 means you cannot take full advantage of the graphics card's impressive capabilities.

Despite having the same high-end graphics card as most PCs here (and the highest-rated CPU), the GT X2 is not the best PC for gaming. PCs using the lower-rated Athlon X2 4400+ processor were noticeably quicker in our 3Dmark 2005 tests due to their higher quantity of Level 2 cache.

The rest of the GT X2 package includes a cordless Microsoft keyboard and optical tilt mouse, some high-quality seven-channel speakers and a small bundle of software including Microsoft Works 8.

If you don't need an enormous amount of storage space and can get past its plain-Jane looks, the GT X2 performs well and represents good value for money.

Personal Computer World RECOMMENDED

Verdict

Pros Highest-rated CPU
Cons Hard drive space
Features ★★★☆☆
Performance ★★★★☆
Value for money ★★★★☆

Overall Fast internal components but not as well equipped as its rivals

★★★★☆

Heatsink funnels can prevent hot air from building up inside the PC

Intellect Prodesk A64x2/4400+

Price £1,699 **Contact** www.intellect.uk.com

Aside from its Kube range of small form factor PCs, Intellect Computers is not very well known for the aesthetic appeal of its systerms. However, the Prodesk is very distinctive thanks to its large silver Antec P180-EU case (or enclosure as it is called on Antec's website).

The P180-EU does not look particularly attractive when the front panel is open but it is designed to be quiet and its unusual three-layer side panel (a plastic panel sandwiched between two aluminium layers) certainly seems effective.

This PC stands out as the only submission to make use of Windows XP Professional x64 Edition. This brings advantages as well as disadvantages. XP Professional x64 Edition's software and driver compatibility issues are well documented and users may find some of their existing components and peripherals will not work as expected.

However, once drivers are available, it will be the best version of Windows XP to own. The Professional Edition of Windows XP gives this PC some extra features over its rivals, most of which use XP Home.

Intellect makes the most of the Prodesk's operating system by supplying 2GB of DDR400 memory (twice that of any PC in the group) and an Athlon 64 X2 4400+ processor. This configuration does not have the same raw processing power as the Mesh or the almost identically equipped Chillblast, but its greater quantity of memory helps speed up the launching of memory intensive applications and large software files such as images, spreadsheets or databases.

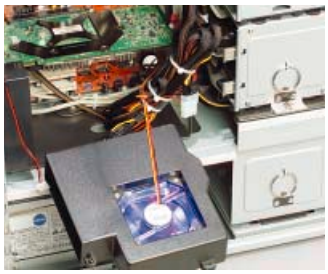
The Prodesk is one of the most expensive PCs in the group. A lot of its price can be attributed to the super-quick Geforce 7800GTX graphics card, but if you don't need the benefits provided by its operating system, some of the others here offer better value.

Verdict

Pros Modern operating system
Cons OS compatibility issues
Features ★★★☆☆
Performance ★★★☆☆
Value for money ★★★☆☆

Overall A solid example of a 64bit PC, but inexperienced users may prefer a more proven operating system

★★★☆☆



The Intellect's unusual exhaust fan channels heat to the back of the case ↘

Medion Pentium D 2.8GHz

Price £928.95 **Contact** www.toysrus.co.uk

If the name Medion looks familiar, it is possibly because you have seen one of the company's limited-run budget PCs at your local supermarket. The Pentium D 2.8GHz is exclusively available through Toys R Us and is the only submission in this group to use an Intel dual-core CPU.

Although the Pentium D 820 has a faster clock speed than its Athlon rivals, plus 1MB of cache memory per core, it was noticeably slower. Its Sysmark 2004 SE score of 198 is roughly what you would expect to see from a 3.2GHz single-core Pentium 4 processor.

This machine isn't built with extreme performance in mind. Instead, Medion has tried to incorporate as many extras as possible to boost its appeal. It is the only submission that comes with a multifunction device. The Lexmark X1180 is not the most advanced device on the market but it offers decent photo printing, scanning and copying for home users.

We didn't expect much from this PC by way of graphics performance but its Radeon X600 Pro is an adequate card that will run the latest 3D games at modest resolutions. There's also a 19in Vusys monitor – a pleasant surprise given that the similarly priced Zoostorm PC ships with a 17in panel.

Medion has also included a digital TV and FM radio tuner card. This is complemented by a front-facing audio/visual panel that has composite and component inputs and outputs. This, together with the Cyberlink Home Cinema Suite software, makes it easy to transfer old VHS recordings to the PC or vice versa. The 320GB of hard disk space isn't the largest here but it should be good for around 300 hours of high-quality video.

If you're not concerned by its comparatively slow performance, the Pentium D 2.8GHz is an excellent buy and is deserving of our Recommended award.

Personal Computer World RECOMMENDED

Verdict

Pros All-in-one printer; TV tuner
Cons Hard drive space
Features ★★★★★
Performance ★★☆☆☆
Value for money ★★★★★

Overall Doesn't show off the full potential of dual-core computing, but is packed with features

★★★★☆

The Lexmark X1180 multifunction device offers good photo printing

Mesh Titan PCW

Price £1,408 **Contact** www.meshcomputers.com

The Mesh Titan PCW is a cut-down version of the Titan Dual X2 Pro reviewed in our August issue. Whereas that PC used an Athlon 64 X2 4800+ processor, the Titan PCW uses the slightly slower X2 4600+. This has the disadvantage of having just 512KB of L2 cache per core, but some good internal configuration means it beats the similarly equipped Evesham entry to the top of our overall performance charts.

This was probably due in small part to the Asus A8N SLI Deluxe motherboard, which offers good performance and a wealth of features. Unusually though, Mesh has paired the motherboard with an ATI graphics card. This is something of a lost opportunity, since it is not possible to install ATI-based graphics cards in an SLI configuration.

If you plan on upgrading the PC with dual graphics cards, you will have to ditch the supplied Radeon X800 in favour of a pair of Nvidia Geforce cards. Leaving the X800 as a standalone card still delivers excellent performance but it is not a patch on the 3D abilities of the newer Geforce 7800GTX. Like most of the group, the Titan PCW uses a 19in TFT panel – in this case the Viewsonic VX912. This is not quite as impressive as the more modern VX924 that accompanies the Evesham.

The rest of the Titan PCW's specification is understandable given its price. We would have preferred a slightly larger hard drive than the 300GB supplied, but Mesh has included an 8-in-1 card reader and 16-speed dual-layer DVD rewriter.

Choosing between the Titan PCW and the Evesham Axis Decimator GT X2 is difficult. The Titan PCW is the better option if you are not that interested in games or upgrading to a dual graphics card setup, but if you have got a bit more money to spend, the Evesham system is a better purchase.

Verdict

Pros Performance; card reader
Cons Unusual choice of graphics card
Features ★★★☆☆
Performance ★★★★☆
Value for money ★★★★☆

Overall Good value for money but could present problems when upgrading the graphics card

★★★★☆

The Titan PCW has a wide range of rear-facing input/output ports

PC Nextday Zoostorm 4400+ Dual Core PC

Price £833 **Contact** www.pcnextday.co.uk

PC Nextday's Zoostorm 4400+ Dual Core PC is the cheapest computer in the group. Unlike the similarly priced Medion submission, the Zoostorm uses an Athlon X2 4400+ CPU. This gives it superior performance but it still lags some way behind the Chillblast PC, which uses the same processor.

The Zoostorm 4400+ has quite a large hard drive for a PC in this price range. Its 250GB Maxtor Diamondmax 10 drive should provide adequate storage for most needs, and there is also a 12-in-1 card reader and 16-speed dual-layer DVD rewriter – features digital photography enthusiasts will like.

One aspect of the Zoostorm's specification some users will not appreciate is the 17in TFT panel. The Benq FP71G is a fine monitor with a fairly quick 12ms response time, and its native resolution of 1,280 x 1,024 is the same as the 19in TFTs that accompany the rest of the PCs in the group. You will technically be able to squeeze the same amount of information onto the screen, but its smaller area means some people may find it slightly harder to read.

The Zoostorm uses a Geforce 6600GT graphics card, which, despite having just 128MB of memory, delivers better 3D graphics performance than the 256MB Radeon X600 card in the Medion PC.

The Zoostorm is one of two PCs in the group (the other being Medion's Pentium D 2.8GHz) that is equipped with a wireless network adapter. This 802.11b/g PCI adapter should come in handy for users who want to create a wireless network or use the PC to stream multimedia files around the home.

On the whole, this is a good all-round PC. It is not as quick as some of the others tested here and its monitor is a disappointment, but the system is still fairly good value for money.

Verdict

Pros Card reader; wireless network adapter

Cons A 19in screen would have been better

Features ★★★☆☆

Performance ★★★☆☆

Value for money ★★★★☆

Overall Almost embarrasses itself with a 17in screen but ultimately is good value

★★★☆☆

Digital photographers will appreciate this 12-in-1 memory card reader

Why dual-core?

SINGLE-CORE CPUs offer excellent performance, but the long-established convention of increasing clock speeds to produce faster processors is coming to an end. The thermal and environmental challenges of making faster processors has contributed to the development of multi-core CPUs, which are now being heralded as the future of computing.

The first generation of multi-core CPUs use two cores and can best be thought of as two processors in one, each with its own cache memory and controller. Dual-core processors are designed specifically to provide better system efficiency and higher performance, particularly in multitasking environments.

Whereas a single-core processor can struggle to assign system resources to several applications at once, dual-core chips can devote an entire core to each set of tasks.

You won't notice their benefits if you are simply running a copy of Microsoft Office, but if you're typing a letter to the tax office, downloading files from the Internet, listening to music and performing a virus scan all at the same time, dual-core CPUs offer unrivalled performance.

The benefit of dual-core processors is not limited to desktop PCs. Reduced power requirements mean multi-core CPUs can help laptops achieve longer battery life without compromising performance.

There are several flavours of desktop dual-core processor and choosing the right one depends on your usage. Intel currently produces the Pentium D 820, 830 and 840 clocked at 2.8GHz, 3GHz and 3.2GHz respectively.

It also produces the Hyperthreading-enabled dual-core Pentium 840 Extreme Edition. Not only can this CPU split its workload across two cores, but each core can further distribute its workload across multiple threads of operation for even better performance in multitasking environments.

AMD offers the Athlon 64 X2 in 3800+, 4200+, 4400+, 4600+, and 4800+ guises. All models have 512KB of Level 2 cache per core, except the 4400+ and 4800+ versions, which have 1MB of cache per core.

In our labs tests (www.pcw.co.uk/labs), the Pentium 840 Extreme Edition CPU outperformed the Athlon 64 X2 4800+ when running multiple applications simultaneously (partly because of its Hyperthreading features), but when running a single application such as video editing, the dual-core Athlon 64 X2 scored best. Watch out for full reviews in future issues of *PCW* of new dual-core CPUs as they are launched.

power computing ltd

EST. 1984

opening hours
mon - fri 9 - 6pm
sat 10 - 4pm
sun closed

All prices include VAT. **t 01234 851500**

Sale Sale Sale!

2 YEARS RTB PARTS & LABOUR WARRANTY
FREE COLLECT & RETURN ON ALL SYSTEMS

Power Cracker
2600+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- AMD Sempron 2600+
- 256MB DDR 3200
- 5.1 On-Board Sound Card
- 40GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- 52x CD Rom Drive
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

Change CDROM to CDRW for only £10.00 Extra!
Or CDROM to DVDRW16x +/- for only £40.00 Extra!

WAS ~~£219.95~~
Save £30!
NOW **£189.95**

Power Evo
3000+ 64bit DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket 754 M/Board
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 6x Rear USB 2.0 2x SATA RAID 0,1,
- AMD Sempron 3000+ 64bit
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- ASUS 52x32x52 CDRW 16x DVD
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

Change CDRW/DVD Combo Drive to DVDRW16x +/- for only £20.00 Extra!

WAS ~~£279.95~~
Save £30!
NOW **£249.95** Inc VAT

Power Predator 64bit
3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN K8S760 M/Board
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- 1x FireWire Port 2x SATA RAID 0,1
- AMD 3000+ 64Bit Skt. 754
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

WAS ~~£359.95~~
Save £40!
NOW **£319.95** Inc VAT

Power AMD64
3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- ASUS A8V-E DELUXE M/Board
- 1xPCI Express x16, 3xPCI, 2x PCI Express x1
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 2x SATA RAID 0,1
- AMD 3000+ 64Bit Skt. 939
- 512MB DDR 3200
- 8 Channel On-Board Sound Card
- 120GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS 6200 NvidiaTurbo Cache Graphics Card Supports 256MB
- Integrated GB Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

WAS ~~£449.95~~
Save £50!
NOW **£399.95** Inc VAT

STAR BUY!

Power Stopper
2600+ DDR PC

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
- 2x Front USB 2.0
- AMD Sempron 2600+
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- Logitech Internet Pro Keyboard
- Logitech Optical Wheel Mouse
- 1.44MB Floppy Disk Drive
- ASUS 52x32x52 CDRW 16x DVD
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- Windows XP Home Inc. CD & Licence
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

Add a 15" TFT for £119.95

Change CDRW/DVD Combo Drive to DVDRW16x +/- for only £20.00 Extra!

WAS ~~£349.95~~
Save £50!
NOW **£299.95** Inc VAT

Power Xtra Black
3000+ 64bit DDR PC

- ATX Midi Tower Case Black 400Watt PSU
- FOXCONN Socket 754 M/Board 400FSB
- 1xAGPx8 3xPCI 4x 1x Parallel
- 2x Front USB 2.0 Rear USB 2.0 2x SATA RAID 0,1,
- AMD Sempron 3000+ 64bit
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 120GB 7200RPM Hard Drive
- **17" TFT 16m/s Silver & Black Flat Panel Monitor Inc. Speakers**
- Logitech Internet Pro Keyboard
- Logitech Optical Wheel Mouse
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS V9520-X Nvidia FX5200 3D Graphics
- Integrated 10/100 Ethernet Card
- 56.6k Internal Dial Up Modem
- Windows XP Home Inc. CD & Licence
- Microsoft Works 8
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

Complete System

WAS ~~£609.95~~
Save £50!
NOW **£559.95** Inc VAT

Millennium Black 64bit
3000+ DDR PC

- ATX Midi Tower Case Black 400Watt PSU
- ASUS A8V-E DELUXE M/Board
- 1xPCI Express x16, 2x PCI Express x1, 3xPCI
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 2x SATA RAID 0,1
- AMD 64Bit 3000+ Skt 939
- 1GB DDR 3200
- 8 Channel On-Board Sound Card
- 120GB 7200RPM Hard Drive
- **19" TFT 16m/s Silver & Black Flat Panel Monitor Inc. Speakers**
- Logitech Internet Pro Wireless Keyboard & Mouse
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS 6200 NvidiaTurbo Cache Graphics Card Supports 256MB
- Integrated GB Ethernet Card
- 56.6k Internal Dial Up Modem
- Windows XP Home Inc. CD & Licence
- Microsoft Works Suite 2005 Inc. Word, Works,Encarta,Photo Standard, AutoRoute
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

Complete System

WAS ~~£899.95~~
Save £100!
NOW **£799.95** Inc VAT

Power Extreme SLI
3500+ DDR PC

- ATX Midi Tower Case Black
- Hiper Type-R 480Watt PSU
- ASUS A8N-SLI Deluxe M/Board M/Board
- 2xPCI Express x16, 3xPCI, 2x PCI Express x1
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 4x SATA RAID 0,1,5
- AMD 64Bit 3500+ Skt 939
- 2GB DDR 3200
- 8 Channel On-Board Sound Card
- 200GB SATA 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- 2x ASUS Extreme 6600GT Graphics Card In SLI Mode
- 2xIntegrated GB Ethernet Card
- Windows XP Home Inc. CD & Licence
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

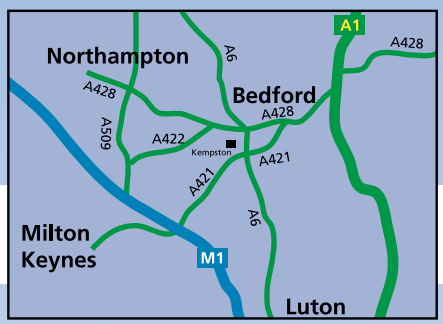
WAS ~~£1050.95~~
Save £50!
NOW **£999.95** Inc VAT

We Custom Build PC's to your specification - please call

WOW!

FREE UK MAINLAND DELIVERY on all ON-LINE ORDERS when you spend £50.00 or more

No Surcharge on Credit Cards!



www.powerc.com

Memory Madness!

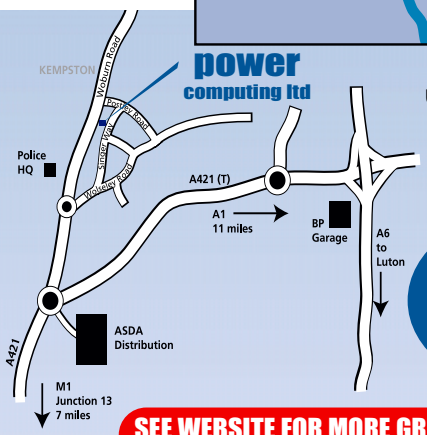
WHILE STOCKS LAST!

DDR2 now available, please call

256MB PC2700 DDR 184PIN 333 mhz	WOW PRICE! £19.95	256MB PC3200 DDR 184PIN 400 mhz	WOW PRICE! £19.95
512MB PC2700 DDR 184PIN 333 mhz	WOW PRICE! £39.95	512MB PC3200 DDR 184PIN 400 mhz	WOW PRICE! £39.95

Memory Pens

128MB USB2.0 Memory Pen. £11.95
256MB USB2.0 Memory Pen. £19.95
512MB USB2.0 Memory Pen. £34.95
1GB USB2.0 Memory Pen. £59.95
2GB USB2.0 Memory Pen. £119.95



power computing ltd

unit 82a , singer way
woburn rd ind. est.,
kempston
bedford mk42 7pu

We Custom build Laptops! Call for details

SEE WEBSITE FOR MORE GREAT OFFERS!
www.powerc.com

Laptops from £499.95

LG DVD/RW16x+/- only £39.95 ! Nero 6 inc.

17" TFT Monitor Silver Inc. Speakers8MS Response Time only £169.95 !

Maxtor 80GB 7200 HD only £39.95 !

Wow! Upgrade your PC for Less!

All prices include VAT.

Hard Drive Upgrades

Maxtor 40GB 7200RPM IDE £33.95
Maxtor 80GB 7200RPM IDE £39.95
Maxtor 120GB 7200RPM IDE £54.95
Maxtor 120GB 7200RPM IDE (8MB Cache) £59.95
Maxtor 160GB 7200RPM IDE (8MB Cache) £64.95
Maxtor 200GB 7200RPM IDE (8MB Cache) £74.95
Maxtor 250GB 7200RPM IDE (16MB Cache) £94.95
Maxtor 300GB 7200RPM IDE (16mb Cache) £124.95
Maxtor 120GB 7200RPM SATA (8MB Cache) £64.95
Maxtor 200GB 7200RPM SATA (8MB Cache) £79.95
Maxtor 250GB 7200RPM SATA (16MB Cache) £104.95
Maxtor 300GB 7200RPM SATA (16mb Cache) £134.95
Removable HardDrive Caddy/Bay IDE £19.95
External Hard Drive Case USB2.0/Firewire £39.95
IDE Rounded Hard Drive /CD Cable £5.95

Monitors All Have 3 Years On-Site Warranty

17" CRT Monitor £69.95
19" CRT Monitor £119.95
15" TFT SILVER/BLACK 16m/s £119.95
17" TFT SILVER/BLACK 8m/s £169.95
19" TFT BELINEA 101902 16m/s £229.95

Modems & Network

56.6k V92 Internal PCI Modem (Rockwell Chipset) £9.95
56.6K V90 External USB Modem £29.95
10/100 RJ45 PCI Network Card £9.95
5 Port Switch Hub. £24.95
8 Port Switch Hub. £29.95
Netgear WG602 Wireless Access Point £59.95
Netgear WGE111 54G Wireless Game Adapter £49.95
Netgear DG632 ADSL Modem USB Router 1x Lan 10/100 .....£49.95
Netgear DG834 ADSL Modem Router 4x Lan 10/100 .....£59.95
Netgear DG834G Wireless ADSL 54G Router 4x Lan 10/100 .....£69.95
Netgear DG834GT Wireless ADSL 108G Router 4x Lan 10/100 .....£99.95
Netgear RP614 DSL Router 4x Lan 10/100 .....£39.95
Netgear WGR614 Wireless DSL 54G Router 4x Lan 10/100 .....£59.95
Netgear WGT624 Wireless DSL 108G Router 4x Lan 10/100 .....£79.95
Netgear WG111TGE USB 2.0 Wireless 108G £49.95
Netgear WG311T PCI Wireless 108G £49.95
ASUS PCI Wireless 54G. £24.95
ASUS USB 2.0 Wireless 54G. £24.95

Ports

USB 2.0 4 Port Internal PCI £14.95
PCI I/O Ports 2x Serial 1x Parallel £19.95
Firewire & USB 2 Combo Card Inc.Firewire Cable & Software. £29.95
USB Bluetooth Dongle Upto 100Metre £29.95
USB Serial/Parallel Convertor £29.95
USB Smart Card Reader 15 in 1 External. £14.95

CDROM\CDRW\DVD Drives (Retail Boxed)

ASUS DVD-E616 16x DVD (Beige or Black) £19.95
ASUS 52x32x52 CDRW,Nero Quiet £19.95
ASUS CDRW\DVD Combo 52x32x52 16xDVD. £29.95
ASUS 52x24x52 External £49.95
LG Dual Layer 16x-/+ DVD RW + RAM (Beige or Black) £39.95

Cases

ATX Midi Tower Case with Front USB 400 Watt £39.95
350 watt PSU £24.95
XPro 400 watt true power £49.95
Hiper Type-R 480 watt black true power £59.95

Graphics Cards AGP

ASUS NVIDIA V9520-X FX 5200 128MB AGPx8 .....£34.95
ASUS NVIDIA N6200GE 128MB AGPx8 .....£79.95
ASUS NVIDIA 6600 256MB AGPx8 .....£104.95
ASUS NVIDIA 6600GT 128MB AGPx8 .....£134.95
ASUS NVIDIA 6800GT 128MB AGPx8 .....£229.95
ASUS ATI 9250 256MB AGPx8 .....£44.95
POWER COLOR ATI 9800 PRO AGPx8 .....£109.95
POWER COLOR ATI 9800SE All In Wonder Inc.TV Tuner & Remote 128MB AGPx8 .....£119.95

Graphics Cards PCI Express 16

ASUS NVIDIA EN6200 Turbo Cache 64MB (Can Share System Ram Up to 256MB) £44.95
ASUS NVIDIA EN6200 128MB £69.95
ASUS NVIDIA EN6600 256MB £104.95
ASUS NVIDIA EN6600 GT 128MB (CAN BE USED IN SLI MODE) £129.95
ASUS NVIDIA EN6800 256MB (CAN BE USED IN SLI MODE) £209.95
ASUS NVIDIA EN7800GT 256MB (CAN BE USED IN SLI MODE) £299.95
ASUS NVIDIA EN7800GTX 256MB (CAN BE USED IN SLI MODE) £399.95

Sound Cards

SoundBlaster 4.1 PCI £14.95
SoundBlaster 7.1 Player Live £19.95
Creative Audigy 2 ZS OEM £59.95
Creative Audigy 2 ZS Platinum Internal. £149.95
Creative Audigy 4 Pro External £169.95

CPU'S

AMD SEMPRON SOCKET A 2600+ Inc. Artic CopperSilent 2 Fan £54.95
AMD SEMPRON SOCKET 754 3000+ 64bit (Retail Boxed Inc. Heatsink & Fan) £69.95
AMD 64Bit 3000+ Socket 754 (Retail Boxed Inc. Heatsink & Fan) £109.95
AMD 64Bit 3000+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £109.95
AMD 64Bit 3200+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £139.95
AMD 64Bit 3500+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £169.95
AMD 64Bit 3700+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £209.95
AMD 64Bit 4000+ Socket 939 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £299.95
AMD 64Bit 4200+ Dual Core Socket 939 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £369.95
AMD 64Bit FX55 Socket 939 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £579.95
INTEL P4 3GHz SOCKET 775 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £129.95
INTEL P4 3.2GHz SOCKET 775 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £159.95
INTEL P4 3.4GHz SOCKET 775 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £199.95

MOTHERBOARDS AMD SOCKET A (Retail Boxed)

Asrock K7S41GX SiS748, uATX, DDR333, VGA10/100 Lan, USB 2.0, 5.1 Audio, IDE, AGPx8 .....£39.95
Asus A7V8X-X VIA KT400(A), ATX, DDR400, 10/100 Lan, USB 2.0, 6Ch Audio, IDE AGPx8 .....£39.95
Asus A7V880 VIA KT880, ATX, DDR400, Gbit Lan, USB 2.0, 6Ch Audio, SATA, Raid, WiFi Port AGPx8 .....£49.95

MOTHERBOARD AMD SOCKET 754 (Retail Boxed)

Asus K8N-E Deluxe NF3 ATX, DDR400, Gbit Lan, USB 2.0, 1394, 8Ch Audio, 4 x SATA, Raid AGPx8 .....£69.95
Foxconn K8S760 MicroATX, DDR400,VGA Gbit Lan, USB 2.0, 1394, 6Ch Audio, 4 x SATA, Raid AGPx8 .....£49.95
Foxconn K8S755A ATX, DDR400, Gbit Lan, USB 2.0, 1394, 6Ch Audio, 4 x SATA, Raid AGPx8 .....£59.95

MOTHERBOARD AMD SOCKET 939 (Retail Boxed)

Asus A8V Deluxe, VIA K8T800Pro, AGPx8 Gbit Lan, USB 2.0, 1394, 8Ch Audio, 2 x SATA, Raid AGPx8 .....£74.95
Asus A8V-E Deluxe-NW S939 PCI-Express Gbit Lan, USB 2.0, 1394, 8Ch Audio, 2 x SATA, Raid £74.95
Asus A8N-SLi (Standard), ATX, PCI-Express, Gbit Lan, USB 2.0, 1394, 8ch Audio, 4 x SATA, Raid £104.95
Asus A8N-SLi Deluxe, ATX, PCI-Express, 2 x Gbit Lan, USB 2.0, 1394, 8ch Audio, 4 x SATA, Raid 5 .....£114.95

MOTHERBOARD INTEL SOCKET 775 (Retail Boxed)

ASROCK 775V88 VIA , ATX, ,DDR 40010/100 Lan, USB 2.0, 5.1Ch Audio, IDE 2x SATA RAID, AGPx8 .....£49.95
Asus P5RD1-V S775 PCI-E ATI Xpress 200 VGA DDR400 8Ch Audio SATA Raid 10/100 USB2 .....£74.95
Asus P5GDC Deluxe i915P, ATX, DDR2-533 & DDR400, Gbit Lan, USB 2.0, 1394, 8Ch Audio, SATA, Raid £99.95
Asus P5AD2-E-Premium PCIE i925XE S775 2xGbit Lan DDR2 1394/AB USB2 SATA&PATA Raid 8Ch Audio £139.95

Motherboard Bundles (Assembled)

ATX Midi Tower Case 400Watt PSU
FOXCONN Socket A M/Board 400FSB
1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
2x Front USB 2.0
AMD Sempron 2600+
256MB DDR 3200
5.1 On-Board Sound Card
Integrated SIS 3D Graphics Card
Integrated 10/100 Ethernet Card £139.95

ATX Midi Tower Case 400Watt PSU
ASUS A7V600-X Socket A M/Board
1xAGPx8 5xPCI 4x Rear USB 2.0 1x Parallel
2x Front USB 2.0 2x SATA Raid 0,1
AMD Sempron 3000+ Inc. Heatsink & Fan
512MB DDR 3200
5.1 On-Board Sound Card
Integrated 10/100 Ethernet Card £179.95

ATX Midi Tower Case 400Watt PSU
FOXCONN K8S760 Socket 754 M/Board
1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
2x Front USB 2.0 2x SATA Raid 0,1
AMD 64Bit 3000+ Inc. Heatsink & Fan
512MB DDR 3200
5.1 On-Board Sound Card
Integrated SIS 3D Graphics Card
Integrated 10/100 Ethernet Card £229.95

all power computing pcs are subject to availability and come with 2 year return to base, parts & labour warranty (free collection & return) on hardware faults only unless otherwise specified by manufacturer. industry standard practice is to quote a monitor crt size, the actual size is one inch less. details correct at time of going to press. prices, specifications subject to change without notice. all sales are subject to power computing ltd terms and conditions, a copy of which may be obtained on request. all trademarks are acknowledged.

all prices include vat.

E & OE

Most Major Credit Cards Accepted

Dual-core PCs

MANUFACTURER	CHILLBLAST	CUBE 24/7	EVESHAM
Model name	Fusion X2 4400 GTX	Aurora	Axis Decimator GT X2
Price inc VAT (ex VAT)	£1,749.99 (£1,489.85 ex VAT)	£1,599 (1,360.85 ex VAT)	£1,599 (£1,360.85 ex VAT)
Sales telephone	0845 456 7830	0870 242 1179	0870 160 9500
URL	www.chillblast.com	www.cube247.co.uk	www.evesham.com
Processor	AMD Athlon 64 X2 4400+	AMD Athlon 64 X2 4400+	AMD Athlon 64 X2 4600+
HARDWARE SPECIFICATIONS			
Motherboard	Asus A8N SLI	Abit AN8 Ultra	MSI MS-7185
Chipset	Nvidia Nforce 4	Nvidia Nforce 4	Nvidia Nforce 4
Available memory/type	1GB Ram DDR400 (XMS)	1GB DDR400 Corsair (matched pair)	1GB Ram DDR400
Occupied/spare memory (Ram) slots	2/2	2/2	2/2
Max memory in this configuration	3GB	3GB	3GB
Max memory supplied by motherboard	4GB	4GB	4GB
Hard disk manufacturer and model	Western Digital WD740GD-00FLA2, Seagate ST3300813AS	Seagate Barracuda 7200.8	Western Digital WD2000JD
Hard disk size	74GB, 300GB	2 x 250GB	200GB
EXPANSION AND I/O			
No of 3.5/5.25in bays	6/6	6/4	6/2
No of free 3.5/5.25in bays	3/4	4/2	3/1
No of PCI/AGP/PCI Express X16 slots	3/0/2	3/1/0	3/0/2
No of free PCI/AGP/PCI Express X16 slots	3/0/1	2/0/0	3/0/1
No of USB2/Firewire ports	8/2	8/3	6/2
No of serial/parallel/PS/2 ports	0/1/2	0/0/2	1/1/2
MULTIMEDIA			
Primary optical drive	LG GSA 4163B	NEC ND3540	Sony DW-Q28A
Optical drive formats and speed (max)	DVD+R: 8x, DVD+RW: 8x, DVD-R: 16x, DVD-RW: 6x, DVD+R DL: 4x, DVD-Ram: 5x, DVD-Rom: 16x	DVD-R: 16x, DVD+R: 16x, DVD-RW: 6x, DVD+RW: 8x, DVD+R DL: 8x, DVD-R DL: 6x	DVD+R: 16x, DVD-R: 16x, DVD+R9: 4x, DVD-R9: 4x, DVD+RW: 8x, DVD-RW: 6x, CD-RW: 24x, CD-Rom: 48x
Secondary optical drive	Sony CRX 230ED	Generic DVD 16x	Sony DDU-1615
Optical drive formats and speed (max)	CD-Rom: 52x, CD-RW: 32x	DVD-Rom: 16x	DVD-Rom: 16x, CD-R: 52x, CD-RW: 24x, CD-R: 52x
Soundcard	Integrated, 7.1-channel high definition (Realtek)	6-channel onboard	Integrated, 7.1-channel high definition (Realtek)
Speakers	None	Creative Labs Inspire T7900	Creative Labs Inspire T7900
Graphics chip/memory	Nvidia Geforce 7800GTX/256MB	ATI Sapphire X850 XT PCI Express/256MB	Nvidia Geforce 7800GTX/256MB
Screen type, size and (max resolution)	NEC Multisync LCD 2070NX, 20in (1,600 x 1,200)	GNR TS900H, 19in (1,280 x 1,024)	Viewsonic VX924, 19in (1,280 x 1,024)
OTHER INFORMATION			
Modem/other hardware	V.90 modem, 6-in-1 card reader	Microsoft wireless keyboard and wireless optical mouse, 7-in-1 card reader and floppy, V.90 modem	None
Networking	Gigabit Lan, 10/100 Lan	Gigabit Ethernet	Gigabit Lan, 10/100 Lan
Operating system	Microsoft Windows XP Professional	Microsoft Windows XP Home	Microsoft Windows XP Home
Bundled software	Norton Internet Security, Microsoft Anti-spyware, Nero Burning Rom, Power DVD, 3Dmark 2005, WinDVD Suite	Cyberlink Power DVD, Nero Suite 6, games pack	Big Fix Bullguard Anti-virus & Security Suite, Sonic DVD Suite, Wanadoo, Microsoft Works 8
Standard warranty (RTB = return to base, C&R = collect and return)	1 year on site	3 years	2 years on site, 1 year RTB
SCORES			
Features	★★★★☆	★★★☆☆	★★★☆☆
Performance	★★★★★	★★★☆☆	★★★★☆
Value for money	★★★★★	★★★☆☆	★★★★☆
OVERALL	★★★★☆	★★★☆☆	★★★★☆

INTELLECT	**MEDION**	**MESH**	**PC NEXTDAY**
Prodesk A64x2/4400+	**Pentium D 2.8GHz**	**Titan PCW**	**Zoostorm 4400+ Dual Core PC**
£1,699 (£1,445.96 ex VAT)	**£928.95 (£790.59 ex VAT)**	**£1,408 (£1,198 ex VAT)**	**£833 (£708.93 ex VAT)**
0870 1225 590	**0800 0388 889**	**08700 464 647**	**No sales number**
www.intellect.uk.com	**www.toysrus.co.uk**	**www.meshcomputers.com**	**www.pcnextday.co.uk**
AMD Athlon 64 X2 4400+	Intel Pentium D 820 (2.8GHz) 2 x 1MB L2 cache	AMD Athlon X2 4600+	AMD Athlon 64 X2 4400+
Foxconn (Winfast) NF4SK8AA-8EKRS	MSI MS-7187	Asus A8N SLI Deluxe	ECS Skt939, ATX2, Nforce4-A939
Nvidia Nforce 4	Intel 945	AMD Nforce 4	Nvidia Nforce 4
2GB DDR400 Ram	1GB DDR2 PC4200 (533MHz)	1GB DDR400	1GB DDR400 (2 x 512MB)
2/2	2/2	2/2	2/2
3GB	3GB	3GB	3GB
4GB	4GB	4GB	4GB
Western Digital WD2500JS	2 x Western Digital 1600L	Maxtor 6L300S0	250GB Maxtor Diamondmax 10, 3.5in IDE 7,200rpm ATA133, 8MB cache
250GB	2x 160GB	300GB	250GB
6/6	3/3	4/3	6/4
4/4	1/1	2/1	4/2
3/0/2	2/0/1	3/0/2	3/1/0
3/0/1	0/0/0	1/0/1	1/0/0
6/1	6/2	6/3	8/3
1/1/2	1/1/2	0/1/2	0/0/2
NEC ND 3540A	Pioneer DVR-109	Sony DW-Q28	Philips PCDV5016B DVD-RW
DVD-R: 16x, DVD-RW: 6x, DVD+R:16x, DVD+R9: 8x, DVD+RW:8x, DVD-Rom: 16x	DVD-R: 16x, DVD-R9: 6x, DVD-RW: 6x, DVD+R: 16x, DVD+R9: 6x, DVD+RW: 8x, CD-R: 40x, CD-RW: 24x	DVD-R: 16x, DVD-R9: 4x, DVD-RW: 4x, DVD+R: 16x, DVD+R9: 4x, DVD+RW: 4x, CD-R: 40x, CD-RW: 24x	DVD-R: 8x, DVD+R: 16x, CD-Rom: 40x, DVD+R9: 2.4x
Samsung SM352-F	Generic 16x DVD-Rom	Sony DDU 1615	Generic 16x DVD-Rom
DVD-Rom: 16x, CD-R: 52x, CD-RW: 24x, CD-R: 52x	DVD-Rom: 16x	DVD-R: 16x	DVD-Rom: 16x
Integrated, 7.1-channel high definition (Realtek)	8-channel Intel high-definition audio	Creative Labs Soundblaster Audigy 2 ZS	Integrated, 7.1-channel high definition (Realtek)
N/A	Integrated in monitor	Creative Labs Inspire T7900	Neutac S2114
Nvidia Geforce 7800GTX/256MB	ATI Radeon X600 Pro/256MB	ATI Radeon X800/256MB	Nvidia Geforce 6600GT/128MB
Sharp LL193G-B, 19in (1,280 x 1,024)	Vusys TFT, 19in (1,280 x 1,024)	Viewsonic VX912, 19in (1,280 x 1,024)	Benq FP71G, 17in (1,280 x 1,024)
None	Wireless keyboard and mouse, V.90 modem, stereo TV and FM tuner card, A/V panel	Logitech cordless rechargeable desktop, 8-in-1 card reader,	12-in-1 card reader
Gigabit Lan, 10/100 Lan	10/100 Ethernet, 802.11b/g wireless	Gigabit Lan, 10/100 Lan	10/100 Lan, 802.11b/g wireless
Microsoft Windows XP x64	Microsoft Windows XP Home	Microsoft Windows XP Home	Microsoft Windows XP Home
Microsoft Works 8 and Office 2003 Small Business Edition (60-day trial)	Microsoft Works 8, Cyberlink Home Cinema Suite, Nero 6 Burning Rom, Nero Recode 2 SE, E-trust Anti-virus 90-day trial, Lexmark X1180 multifunction device	Microsoft Works 8, Cyberlink PowerDVD 5, Power2Go 4, Powerproducer 3, Powerdirector 3, Mediashow SE, PowerDVD Copy, Powercinema 4, 60-day Microsoft Office trial	None
3 years on site	1 year RTB	3 years on site hardware warranty (mainland UK only)	1 year (3 months C&R)
★★★☆☆	★★★★★	★★★☆☆	★★★☆☆
★★★☆☆	★★☆☆☆	★★★★☆	★★★☆☆
★★★☆☆	★★★★★	★★★★☆	★★★★☆
★★★☆☆	★★★★☆	★★★★☆	★★★☆☆

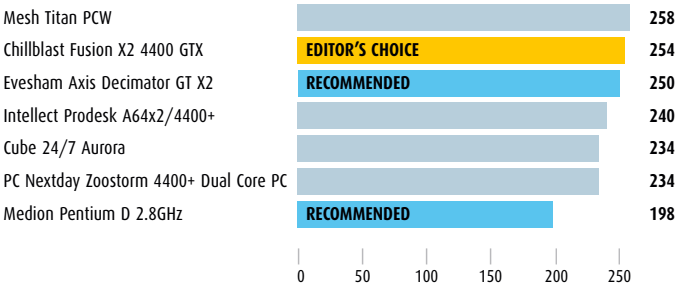
Vendors of group test products are only obliged to sell them at the prices quoted here (which include delivery and credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances.

Lab results

These results show that PCs using higher-rated CPUs aren't always the fastest. The CPU's quantity of cache memory and types of application also affect performance.

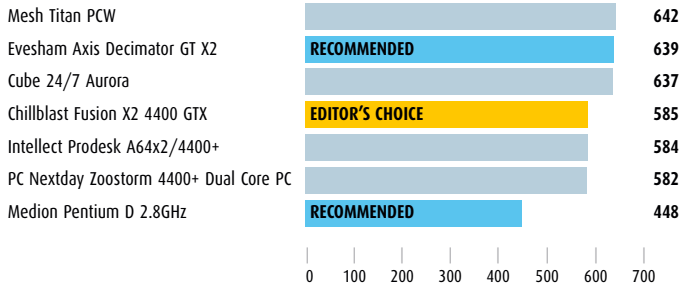
Sysmark 2004 SE

Bigger is better



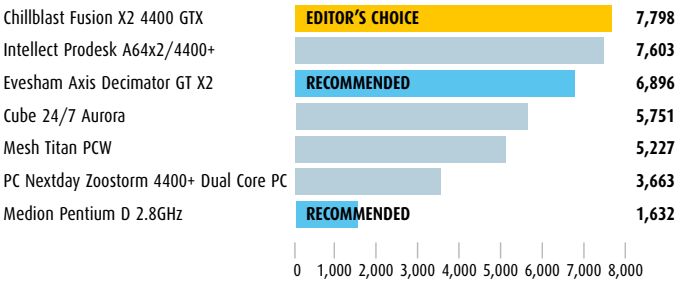
Cinebench (multi-core)

Bigger is better



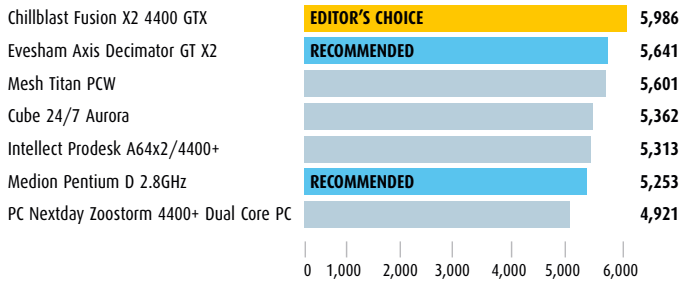
3Dmark05

Bigger is better



PCmark 2005

Bigger is better



Please see page 111 for an explanation of how we tested the PCs

Editor's Choice

Editor's Choice Chillblast Fusion X2 4400 GTX
Recommended Evesham Axis Decimator GT X2 • Medion Pentium D 2.8GHz

Chillblast Fusion X2 4400 GTX

Evesham Axis Decimator GT X2

Medion Pentium D 2.8GHz

As expected, this group test has illustrated that PCs with dual-core CPUs offer a performance benefit over their single-core counterparts. It was also refreshing to see that, despite the extra horsepower, PCs using this new technology are still affordable.

The technology is most exciting in high-end PCs, but dual-core computing means that PCs at budget prices can now compete with expensive single-core PCs.

The PC Nextday Zoostorm submission, for example, costs just £833 but can still outperform most of the non-gaming single-core PCs we've reviewed over the course of the year.

Our first Recommended award winner also offered great value for money. The Medion Pentium D 2.8GHz was the only entry to use an Intel dual-core CPU and, although its performance was not thrilling, it was the most well-equipped entry by far. It is the only PC here that includes a multifunction printer/scanner/copier and, unlike the Zoostorm, it also has a 19in TFT screen, TV and FM tuner and a front-mounted audio/visual panel.

Our second Recommended award goes to the Evesham Axis Decimator GT X2. This PC did not quite top the performance graphs but it was not far behind the top-scoring Mesh entry. Choosing between these two PCs was difficult but, despite its higher price, we think the Evesham is marginally better. This has a lot to do with the fact that, while the Mesh Titan PCW uses an SLI-ready motherboard, it lacks an SLI-ready graphics card, which could present complications when upgrading. The Decimator GT X2 is slightly better configured, as it uses an SLI-ready graphics card and motherboard.

The Decimator lacks the storage space of entries such as the Cube 24/7 Aurora, or even the Zoostorm entry, but if you're not a massive hoarder of multimedia files, the 200GB hard drive should be adequate. If not, its 16-speed dual-layer DVD rewriter is a great way of creating regular backups.

Our Editor's Choice award winner is the Chillblast Fusion X2 4400 GTX. As we have seen with previous Chillblast entries, this PC offered better performance than others using a near-identical configuration. It even outperformed the Evesham entry, which has a higher-rated CPU.

The Fusion X2 4400 GTX has some great components. Like most of the other entries, it uses the fastest graphics card on the market but it is the only submission that allows you to exploit its full 3D potential through a high-resolution 20in monitor. Despite its high-performance components, the Fusion X2 4400 GTX does not cost the earth.

Whichever PC you choose, it is clear dual-core computing is the way to go if you are buying a new PC. **PCW**

For those **in the know**

3ms...

Another World Record

Demonstrating its technology leadership in the display market, ViewSonic offers the super-fast LCD monitors. Featuring ultra-fast 3 millisecond (ms) average video response time across the entire colour scale, the 19-inch VX924 and 17-inch VX724 deliver fluid, full-motion images and optimised video performance for a variety of applications.

PC PRO A LIST
VX924
PC Pro
August 2005

VX924
Custom PC
August 2005

PC ADVISOR GOLD
VX924
PC Advisor
September 2005

VX724
Custom PC
October 2005

VX724
17"- designer LCD monitor,
3ms response time (grey to grey)
300cd/m², 500:1 (typ.),
1,280 x 1,024, TCO'99,
analogue + digital inputs

VX924
19"- designer LCD monitor,
3ms response time (grey to grey)
270cd/m², 550:1 (typ.),
1,280 x 1,024, TCO'99,
analogue + digital inputs

www.ViewSonic.co.uk

ViewSonic
the choice of professionals

Colour laser printers that copy, scan and fax used to be this big.

Now there's an all-in-one that isn't.

There have been all-in-one colour laser printers before, but never this small, this fast or at this price. Nothing has been compromised. The A4 Epson AcuLaser CX11N series gives you the exceptional quality and speed your business demands - whether you're printing, scanning, copying or faxing. Now your only dilemma is what to do with the extra space it creates.

www.epson.co.uk

EPSON®
EXCEED YOUR VISION

Espionage exposed

As spyware and adware become more pervasive, Nigel Whitfield explores 12 of the latest packages that can help you to combat the threats to your PC

ON TEST

86 Aluria Spyware Eliminator 4.0
Bulletproof Soft Spyware/ Adware Remover 9.2
Lavasoft Ad-aware SE Plus

87 McAfee Antispyware 2005
Microsoft Antispyware Beta
Noadware 3

88 Paretologic Xoftspy 4.15
PCTools Spyware Doctor
Spybot Search and Destroy

89 Symantec Norton Internet Security 2005 Antispyware Edition
Webroot Spy Sweeper 4
Yahoo Toolbar with Antispy

90 Table of features

92 What is spyware?
How we tested
Editor's Choice

'You can infect your PC with spyware by installing "free" software that buries a clause about ad software deep in the conditions you agree to'

Viruses are one of the more obvious threats to computer users on the Internet, but there are some programs that are arguably just as much of a nuisance, and more likely to end up infecting your system – spyware and adware.

Unlike viruses, these programs might not destroy your data, but they can be intrusive in other ways, slowing down your PC, popping up unsolicited adverts when you're surfing the net, and in some cases sending data that identifies you personally to companies that want to build up consumer profiles, so they can bombard you with even more junk.

While everyone recognises the need to have anti-virus software, when it comes to protection from ads, many people don't go much beyond turning on pop-up blocking in their browser. These days, that's not nearly enough and it's surprisingly easy for your system to become infected. You can even do it unwittingly by installing 'free' software from the Internet that buries a clause about ad software deep in the conditions you agreed to.

When you do have to clear up an infection, you'll find plenty of anti-spyware products available, claiming to resolve the problems, or prevent you from being infected in the first place. But how well do they really work? Can they remove the most persistent problems, and are they simple to use without being intrusive? We've put 12 through their paces, to find the best way to keep your system clean.

Aluria Spyware Eliminator 4.0

Price $29.99 (approx £17) **Contact** www.aluriasoftware.com **Overall** ★★☆☆☆

Aluria's Spyware Eliminator will include an anti-virus tool and a spam filter, as well as anti-spyware

Aluria offers a free tool on its website, but it's simply for scanning and reporting, directing you to a web page showing what's been detected. It listed one of the lowest number of items found in our tests.

Spyware Eliminator is part of a planned suite that will include anti-virus tools and a spam filter, which you can try alongside the anti-spyware. We didn't test those elements. A common interface allows access to all three components, with a slick look and automatic updating and scheduling. Despite the information in the readme, some advanced options weren't turned on by default.

A home page protection option lets you reset your browser home page and should prevent it from being changed, so we used that after our initial scan and remove. There are settings for broadband and dial-up users, but it's not clear what the difference is; we used the broadband option. You can also check for Winsock problems, but we'd rather see that done automatically.

Scanning time was fairly slow and, like the free scanner on the Aluria site, it only spotted five items, plus several cookies. Home page protection only seemed to work after a couple of attempts. And, though it's little consolation if you don't want any pop-ups, we did have to surf more before intrusive ones appeared.

Overall A slick interface, but relatively slow scanning speed and it only detected a few pieces of spyware.

Bulletproof Soft Spyware/Adware Remover 9.2

Price $29.95 (approx £17) **Contact** www.bulletproofsoft.com **Overall** ★☆☆☆☆

Scanning mode was quite slow and presentation of results lacked clarity

Another program that scans free, but needs payment to fix anything, Bulletproof Soft Spyware Remover also rejoices in an interface that, by default, features crawling spiders, presumably to make you think about spyware. It listed 1,444 items found on our test PC, by counting every cookie, file and Registry entry separately, rather than grouping them with the infestation they related to.

In terms of the number of things found, it was around average, though the presentation of results lacked clarity and simply gave an overview of the class of threats, rather than threat-specific details.

There's a separate area in which things like browser 'helpers' are listed, which isn't immediately obvious, nor is the separate hijack scanning tool. Unless you're fairly sure you know which Registry keys or toolbars you want to keep, both have the potential to confuse, rather than help users, and we'd prefer to see this side of things better automated and with more help.

Scanning performance in detailed mode was quite slow, but didn't find anything more than a quick scan, and removal still left us with pop-up ads, though the home page was restored to its default following an attempt to hijack it by spyware that wasn't removed.

Overall A slow scanner with poor presentation of results and there is little documentation for some options.

Lavasoft Adaware SE Plus

Price €22.74 (approx £15.50); 1 year of updates **Contact** www.lavasoft.com **Overall** ★★☆☆☆

Unfortunately, the free version now lacks the automatic scanning function on start-up

Lavasoft's Adaware is one of the longest established and most well known of the ad and spyware removal tools. There's a free version which now lacks the automatic scans on start-up that made previous versions such must-haves. You now need to install a paid-for copy to have that functionality, but the price is still pretty attractive.

Scanning time is reasonable – not as quick as some, but tolerable – and you can have a quick 'smart scan' each time your system starts up. We found that relatively few infestations were spotted, compared to the other products on test. Each of those has a rating to give some idea of how serious it is, and you can click to see a 'Threat Assessment Chart' on the Lavasoft ad site, though we didn't find the information particularly illuminating.

Other useful features include the ability to create an ignore list, and optional plug-ins that can alert you to Registry changes and other issues. However, even though we were told the detected threats had been removed, they still appeared afterwards, and we still suffered from advertising pop-ups while browsing.

For a product with such a good reputation, we were disappointed at the relatively short list of items detected and we'd like to see more detailed threat reports, to help people decide which things they do need to remove from their system.

Overall The lacklustre performance and lack of detailed information about the threats detected, are disappointing in such a well-known package.

McAfee Antispyware 2005

Price £24.99 **Contact** www.mcafee.co.uk **Overall** ★★☆☆☆

McAfee's first foray into anti-spyware is marred by less-than-perfect removal performance

This is the first release of McAfee's anti-spyware product, and frankly it shows. The standard McAfee Security Center is installed along with the application, but it doesn't actually provide a link to launch the anti-spyware product, which you have to do from the desktop or the Start button.

We're unsure of the wisdom of relying on an Active X control to manage updates; clicking update launched our default browser, Opera, which was unable to do anything with the URL it was passed. We had to fire up our spyware-infested copy of IE and paste the correct address into that – hardly confidence inspiring.

Once we were over that hurdle, however, performance wasn't too bad; scanning was slower than some, but much better than the worst on test. Antispyware 2005 found an impressively long list of 22 problems, covering all our main annoyances, and it said it had fixed them all too. We certainly had no pop-up ads after restarting, but we still had a hijacked home page, and some – though not all – of the extra IE toolbars. A second scan found that 10 of the original 22 items were still present, in one form or another. We'd rather have been told removal wasn't 100 per cent successful, than finding out ourselves when we scanned again.

Overall While it detected lots of spyware, McAfee wasn't as good at removal, and the package lacks integration with its other tools.

Microsoft Antispyware Beta

Price Free **Contact** www.microsoft.com/uk **Overall** ★★★★☆

Despite being a beta version, Microsoft Antispyware is already a polished product

Microsoft's product isn't officially released yet, but the latest beta version can be downloaded free from the company's website.

All the features you'd expect are there, including scheduled updates and scans, and there's fairly useful information about what to do when spyware is detected. On-screen pop-up ads in the style of tools such as Zonealarm alert you, and the program appeared to detect a reasonable range of the software that was infecting our test machine.

It was also the only one that correctly restored our home page to the original, rather than the default. That said, it also claimed to have removed some toolbars that were still conspicuously present when we restarted the PC, and a second run was needed to remove some spyware that the first claimed to have fixed.

There's also a good range of tools to detect spyware before it infects your computer, which should help keep things clean in future. For that reason alone, the beta is well worth a look and, if the final version remains free, it should definitely be worth installing, alongside one of the other tools, to give you early warning when something unpleasant tries to install itself on your PC.

Overall Although still a beta, Antispyware is more successful than much of the competition, and well worth the free download.

Noadware 3

Price $29.95 (approx £17) **Contact** www.noadware.net **Overall** ★☆☆☆☆

Installation is straightforward and scanning was one of the quickest on test

Noadware's tool is a little unusual in that, while you can try it free, it doesn't do anything other than tell you how horribly infested your PC is. To remove the spyware, you have to hand over your credit card. You can either consider that a handy way to avoid wasting money or a marketing method called 'gun to the head-ware'.

Installation is fairly straightforward, and it was one of the quickest at scanning. It produced a comprehensive-looking list of infections – though that did include one program, identified as Kazaa, that's never been anywhere near our test PC.

One annoyance we found was that the default options seemed to err too much on the open side, allowing your home page to be hijacked, for instance. We'd rather see the system locked down so you can tailor it yourself, but you have to turn on IE and ActiveX protection yourself – something that should be the default if good protection is to be offered.

Similarly, an automatic scan at start-up – when many infections try to re-establish themselves – wasn't enabled by default. More positively, Noadware made backups before removing files.

As with most of the other applications, however, removal was far from perfect. While our home page was no longer hijacked, we still had unwanted toolbars, and pop-ups in Internet Explorer, and the software continued to report instances of applications it said it had removed.

Overall This software provides reasonable performance, and the good reports are handy, but removal lets this package down. ↘

Paretologic Xoftspy 4.15

Price $39.95 (approx £22) **Contact** www.paretologic.com **Overall** ★☆☆☆☆

With around 1,500 items found, the results can be a bit daunting

Paretologic's Xoftspy 4.15 is like Noadware's offering, in that you can scan to see what you have on your system, but you can't remove it. And when you find that there are 1,500 things on your PC, you certainly feel like reaching for the credit card so you can pay to remove them.

Scanning is very quick and the 1,500 items found included every cookie and file that every piece of spyware installs on your PC. After rebooting, we were assured there were only seven left to remove, which were duly killed by another scan and clean, and our home page was reset to the value we'd entered into Xoftspy. However, we still had unwanted pop-ups affecting our browsing.

The interface to Xoftspy is straightforward, though the buttons down the side of the screen are a little cramped and dated. We'd also rather see a more useful presentation, grouping potential threats together as in other packages, instead of listing each file separately – it makes the numbers look good, but the actual number of threats detected seemed no better than average, as did the removal performance. We'd like to have seen more details about the things found, but when you have 1,500 of them, it can be quite difficult to be specific.

Overall Quick scanning, but the way results are presented seems to maximise terror and minimise useful information.

PCTools Spyware Doctor

Price Free/£19.95 **Contact** www.pctools.com **Overall** ★★★☆☆

A professional-looking free package with an alarmingly high detection rate

Spyware Doctor is one of the most professional-looking of the packages we tested offering free scan and removal, and it is very easy to install. It automatically does a detailed scan of your system immediately after installation and found an alarmingly high number of problems – almost 7,000 of them. Thankfully, that wasn't an invitation to part with credit card details, and the results are presented in a clear way, grouped according to the threat that they belong to, with a brief explanation of each available when you double-click. But this did help illustrate the problems facing the spyware industry – it detected a cookie from Aluria as evidence of 'rogue anti-spyware' that uses 'pressure selling'.

The scanning facility is free and you can remove infections without paying, but the Onguard facility, which provides realtime monitoring and protection, requires free registration. Some of the detected programs were correctly removed from our but test system, we still suffered from pop-up ads, though the browser home page, once reset, was no longer hijacked and many of the extraneous icons added to our desktop were also removed, leaving a cleaner system than many of the competitors. The paid-for version also offers support, but there's little reason to upgrade from the free version.

Overall Good performance, informative results and a slick look, all available free.

Spybot Search and Destroy

Price Free **Contact** www.spybot.info **Overall** ★★★☆☆

The results display is clear and simple, making it easy to track down unwanted spyware

One of the most well-known free packages, Spybot Search and Destroy has a fairly straightforward interface, though it lacks the graphical polish of some of the competition.

It scanned quickly and found a reasonable number of problems on the system, but cleaning was hampered by dialogue boxes that couldn't be resized and had two main buttons, neither of which was legible since they were overlapped by the window border – hopefully not an issue with every graphics card and driver.

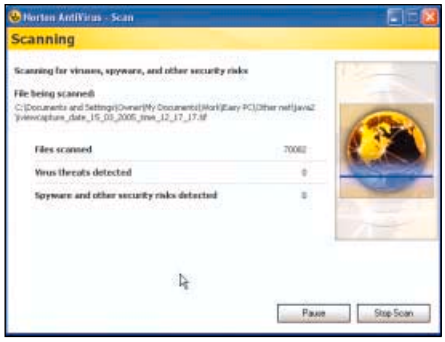
The results display, though, is clear and simple to understand, with real threats in red, and usage tracks – cookies and so on – in green, with explanations that will help you decide whether or not some products need to be removed. Spybot was one of only a few products in the test to spot the Backweb process that our HP PC uses to provide update notifications, and adding it to the whitelist was very simple.

The documentation and links to help you find details about different pieces of spyware are some of the most useful things in this program. This can help make it much easier to track down the culprits, if you're unsure which application let the spyware in. But ultimately, after running Spybot Search and Destroy, we still had a hijacked home page and pop-up ads.

Overall It's free, quick and provides useful information about the threats on your PC, even if it doesn't fix them all.

Symantec Norton Internet Security 2005 Antispyware Edition

Price £45.47; 366 days of updates **Contact** www.symantec.co.uk **Overall** ★★☆☆☆



The search results were rather disappointing considering the long scanning time

Symantec, like McAfee, is one of the big names in net security, and a relatively recent arrival at the anti-spyware party. In fact, this product isn't really a standalone spyware removal tool at all. It's Norton Antivirus with a few extra definitions thrown in to help it detect some extra activity from spyware programs.

And, on the basis of our tests, it hasn't had that many definitions added. As we explain elsewhere, it's hard to compare performance when all the programs use different terminology, but when a program reports only four items of potential spyware when others are reporting 10 or 20, it's perhaps not as thorough. That's doubly disappointing considering that a full scan took more than an hour longer than the next slowest application in our tests, and system performance as a whole suffered from the Norton slow-down effect.

To add insult to injury, we were warned about MSN Messenger starting up, 9MB of updates had to be downloaded on the first run, and after the long wait for a scan, we still had to endure pop-up ads. At least the home page hijack was detected and changed to a handy Symantec Knowledgebase article explaining how we could set it back to what we wanted.

Overall Slow scanning and a heavy impact on system performance aren't helped by poor clean-up rate.

Webroot Spy Sweeper 4

Price $29.95 (approx £17) **Contact** www.webroot.com **Overall** ★★☆☆☆

Despite claims that Spy Sweeper had cleaned our system, we still had a hijacked home page

Webroot is one of the major movers in the Anti Spyware coalition, and its package is fairly well known. You can download and try it for 14 days without having to pay anything. There's a good range of options, including protection 'shields' that you can turn on and off to prevent access to common ad sites, redirection of websites in your Hosts file and so on, along with a built-in scheduler.

In our tests we found that it detected a lot of the installed spyware, and claimed to remove it, but our test system hung during rebooting, and we had to disconnect the power before getting any further. Also, while Spysweeper told us it had cleaned the PC, we still had pop-up ads, toolbars and a hijacked home page – hardly the hassle-free environment we'd expected after being told the system was clean.

With the ad shield function turned on, the result was almost the worst of both worlds – the intrusive adware pop-ups still appeared, but pages on *The Guardian* website were full of errors from blocked ad banners. We'd probably have had better results by using a browser's pop-up blocker. Despite being told to ignore it, each boot prompted a warning that there was an entry in the Hosts file for our Apple Idisk service. A shame, considering the reporting was concise and helpful, without being too alarming.

Overall Reasonable detection, but poor clean-up mars this package's performance.

Yahoo Toolbar with Antispy

Price Free **Contact** http://toolbar.yahoo.com **Overall** ★★☆☆☆

Yahoo's entry into the anti-spyware market may be fast, but left some questions over stability

Just as the big anti-virus vendors are getting involved with spyware removal, so too is Yahoo, with the latest version of its toolbar adding an anti-spy facility.

Installation is fairly straightforward, though when we first tried to launch the Antispy application from the toolbar, it took so long to appear that we'd already started shutting down the PC for a reboot. And since one of the annoyances of spyware is the hijacking of your search and start pages, it seems odd that the default is to change your search page to Yahoo.

Scanning performance is quick, coming in at under a minute and still listing a reasonable selection of threats. That said, only one was marked to remove, with the rest to be reviewed – likely a product of caution based on the 'agreements' some spyware authors think they have with the people they infect.

To remove, we clicked Remove All and confirmed our choice, but this took some time and, once again, we wondered if it had stopped. The system was also reluctant to reboot after removal, and we had to pull the power cord. After that, we had a better experience, with a restored home page and less spyware, but still unwanted pop-up ads. As a toolbar plug-in, Antispy is available only to users of Internet Explorer; it doesn't install a standalone application, and that is a serious omission.

Overall Very fast scanning, but we have reservations about the stability, and removal performance is no better than any others. ↘

Anti-spyware packages

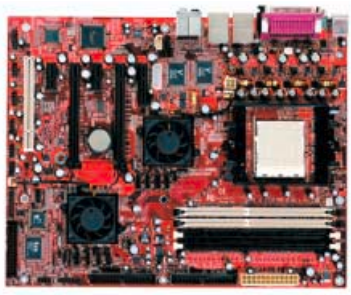
MANUFACTURER	ALURIA	BULLETPROOF SOFT	LAVASOFT	MCAFEE	MICROSOFT	NOADWARE
					Personal Computer World RECOMMENDED	
Product	Spyware Eliminator 4.0	Spyware/Adware Remover 9.2	Adaware SE Plus	Antispyware 2005	Antispyware Beta	Noadware 3
URL	www.aluria software.com	www.bulletproof soft.com	www.lavasoft.com	www.mcafee.co.uk	www.microsoft. com/uk	www.noadware.net
Cost	$29.99 (approx £17)	$29.95 (approx £17)	€22.74; 1 year of updates	£24.99	Free	$29.95 (approx £15.50)
Limitations in free versions	Web scan only	Scan only	No auto schedule	N/A	None	Scan only
Full scan time (hours:mins:secs)	00:17:32	00:30:38	00:11:19	00:18:00	00:10:45	00:04:35
Scheduling	✔	✔	✔	✘	✔	✔
Auto updates	✔	✘	✔	✔	✔	✔
System requirements	Windows 98 or higher, 128MB of memory, 100MB of free hard disk space	Windows 95 or higher, 5MB of free hard disk space	Windows 98 or higher, IE 5.5, 24MB of memory, 25MB of free hard disk space	Windows 98 or higher, IE 5.5, 32MB of memory, 5MB of free hard disk space	Windows 2000, XP or Server 2003, IE 6, 64MB memory, 10MB disk space	Windows 95 or higher, 64MB of memory, 3MB of free hard disk space
Realtime protection	✔	✔	✔	✔	✔	✔
Pros	Good interface	Quick scan as effective as full one	Straightforward to use	Clear interface	Good performance; free	Quick scanning; good reporting
Cons	Advanced options not turned on by default	Slow to scan; poor documentation	Poor information about threats	Lacks integration with other McAfee products	Beta; may not remain free	Default options not strict enough
Overall	There are equally effective free solutions	Lacklustre performance isn't made better by a deliberately quirky interface	The free version may be useful as a backup scanner, but we weren't impressed with performance	A good-looking package that fails to live up to what you'd expect, given its pedigree	One of the best performers, worth installing	Reasonable performance, and good reports are handy, but removal lets this package down
SCORES						
Features	★★☆☆☆	★☆☆☆☆	★★☆☆☆	★★☆☆☆	★★★★☆	★★☆☆☆
Ease of use	★★★☆☆	★☆☆☆☆	★★☆☆☆	★★★☆☆	★★★☆☆	★★☆☆☆
Value for money	★☆☆☆☆	★☆☆☆☆	★★☆☆☆	★★☆☆☆	★★★★☆	★☆☆☆☆
OVERALL	★★☆☆☆	★☆☆☆☆	★★☆☆☆	★★☆☆☆	★★★★☆	★☆☆☆☆

MANUFACTURER	PARETOLOGIC	PCTOOLS	SPYBOT	SYMANTEC	WEBROOT	YAHOO
		Personal Computer World RECOMMENDED				
Product	Xoftspy 4.15	Spyware Doctor 3.2	Search and Destroy	Norton Internet Security 2005 Antispyware	Spysweeper 4	Toolbar with Antispy
URL	www.paretologic. com	www.pctools.com	www.spybot.info	www.symantec. co.uk	www.webroot.com	http://toolbar. yahoo.com
Cost	$39.95 (approx £22)	Free/£19.95 1 year of updates	Free	£45.47; 366 days of updates	$29.95 (approx £17)	Free
Limitations in free versions	Scan only	Scan and remove only	None	N/A	14-day trial	None
Full scan time (hours:mins:secs)	00:03:02	00:10:40	00:04:16	01:22:20	00:08:00	00:00:52
Scheduling	✔	✔	✔	✔	✔	✘
Auto updates	✔	✔	✔	✔	✔	✔
System requirements	Windows 95 or higher	IE 5.5 (6 preferred), 20MB of memory, 8MB hard disk space	Windows 95 or higher	Windows XP or 2000, IE 5.5, 300MB of free hard disk space	Windows 98SE or higher, 128MB of memory, 25MB disk	IE 5 or above
Realtime protection	✘	✔	✔	✔	✔	✘
Pros	Fast scan	Clear presentation of results	Fast and lots of information about threats	Includes complete anti-virus protection	Wide range of protection and detection features	Simple installation
Cons	Alarmist reporting	Live protection not in free version	Some interface problems	Very slow scanning	Poor removal; ad blocking random	Installs via IE toolbar
Overall	Let down by poor reporting and removal; we can't recommend this tool	Removal not much better than others, but the free version is worth installing	A good free tool, let down by the interface problems we encountered	Good anti-virus features but spyware performance is a let-down	Ad shield removed legitimate ads	A useful addition to the Yahoo toolbar, but not a real solution in itself
SCORES						
Features	★★☆☆☆	★★☆☆☆	★★☆☆☆	★★★☆☆	★★★☆☆	★☆☆☆☆
Ease of use	★★☆☆☆	★★★☆☆	★☆☆☆☆	★★☆☆☆	★★☆☆☆	★★★☆☆
Value for money	★☆☆☆☆	★★★☆☆	★★★☆☆	★★☆☆☆	★★☆☆☆	★★★☆☆
OVERALL	★☆☆☆☆	★★★☆☆	★★★☆☆	★★☆☆☆	★★☆☆☆	★★☆☆☆

↘

Foxconn NFPIK8AA-8EKKRS

- **Processor:** AMD Opteron™ (dual core support)
- **Chipset:** NVIDIA® nForce Professional
- **Memory:** Dual Channel DDR400 4DIMMS max 8GB memory
- **Flexible Expansion:** 2 x PCI Express™ x 16 (function in true x 16 signal mode), 1 x PCI Express™ x4, 2 x PCI Express™ x1, 1 x PCI
- **Latest Drive Technology:** 8 x SATAII/300 (w/RAID), 2 x ATA/133
- **High Speed Connectivity:** Dual integrated Gigabit Ethernet LAN Ports, Firewire 1394a & 1394b



Key Benefits:

- Support for dual PCI Express™ x16 graphics accelerators in TRUE x16 signal mode using NVIDIA's Scalable Link Interface (SLI) technology.
- Unique implementation in a standard ATX form factor
- Fully supports the NVIDIA® nTune performance optimization utility

Drive your technology forward with Foxconn, the world's largest OEM motherboard manufacturer. With extreme performance and stability – You know it's the right choice.

Think of any well known computer brand, mobile phone and consumer electronics product. Chances are Foxconn produced them all.

MOTHERBOARDS, CASES, BAREBONES AND COOLERS

ebuyer www.ebuyer.com

ECLIPSE COMPUTERS www.eclipsecomputers.com

MISCO www.misco.co.uk

LIGHT www.lightcomputers.co.uk

FOXCONN®

www.discover-foxconn.co.uk

visit our website to find your preferred reseller

What is spyware?

SPYWARE is a fairly broad category, and when you start to look at it in depth, it's easy to see why the task facing removal programs can be complicated. If a program installs itself on your computer without permission, and tells someone else what you look at online, they can display 'appropriate' adverts; or if a website hijacks your browser so you go to a different home page, or search using their search engine, that's clearly malicious.

What about that animated cursor, or pack of smileys or screensavers you downloaded? Some 'free' software is 'advertising supported', which means it installs components – often called adware – that pop up adverts on your screen. For the developers, it might make more money than the shareware model, but it's annoying. You might have agreed to it happening – buried in the terms you agreed to will be a clause giving your consent. So if you've done that, can another program disable the advertising program? Or is it a legitimate application? Writers will doubtless claim it's a user's fault for clicking on agreements – but some of the ones we've seen simply say you agree to terms on a named website – hardly a model of transparency. But it's this ambiguity that leads to many spyware applications warning you that you may be breaching other licences by cleaning your system.

The industry also needs to get to grips with naming; some of the most widely known pieces of spyware appear with different names depending on which tool you use to scan your computer, while others may report each Registry entry as a separate infection, rather than all caused by the same one.

The Anti Spyware Coalition (www.antispywarecoalition.org) is drawing up an agreed definition of spyware, which will help the first of those problems, and hopefully will follow that up with a naming scheme, such as that used for viruses, making it easier to compare packages.

How we tested

TESTING anti-spyware is not straightforward, and the lack of a common naming scheme makes comparisons tricky. But the one thing that's very easy is getting infected in the first place. For our tests, we removed the security software on our test PC, and visited a number of sites known to hijack browsers. We also installed some notorious 'advertising supported' software, and happily agreed to the ActiveX controls that websites assured us would enhance our experiences.

The end result was a PC festooned with annoying toolbars in Internet Explorer, pop-up ads, redirected web searches and with considerably slower performance than before. Among the problems installed were Claria's Gain/Gator system, Comet Cursors, UCMore, Coolwebsearch, Mywebsearch and Lop.

A Norton Ghost image taken at this point allowed us to establish how well each application succeeded in cleaning up an already infected PC, which is the point at which many people will consider buying one of these tools.

Naming issues make it hard to be sure if two programs are removing the same problem, so we continued to use the PC after it was reported clean, to see if that was the case, and to ensure the automatic reinstallation of some spyware was prevented. Additionally, we tested the time taken to scan the whole C drive of the system – unless you can scan quickly and automatically, you're unlikely to do it as often as you should, we feel.

Editor's Choice

Recommended Microsoft Antispyware Beta • PCTools Spyware Doctor 3.2

Microsoft Antispyware Beta

PCTools Spyware Doctor 3.2

Anti-spyware products are not as well developed as anti-virus applications. In the anti-virus world, you really can get by with one application and, to a great extent, the differences between them are largely in the areas of ease of use, frequency of updates and the type of support you get.

As our tests revealed, that's still not the case with anti-spyware applications. Different programs have different names for the same things and some of the tools simply don't manage to do the clean up job that they promise. Some pieces of adware are notoriously hard to clean up, but we'd rather see programs admit that they might not have fixed the issue, than claim to have cleaned up the problem only for it to reappear on the next scan.

Ultimately, none of these programs is really satisfactory; some are alarmist, making you fearful of every cookie, while others are complicated to work, with poor interfaces.

That doesn't mean, however, that they're useless. While this type of software as a whole rates a 'could do better', you do still need tools on your PC to keep you protected. We just don't think you can do it with only one of the programs that we've tested. For most people the solution is to install two or more of these tools and use them in tandem.

Our Editor's Choice, then, is somewhat constrained – it's hard to recommend that you spend money on a product that, in our tests, failed to clear up the mess that it's supposed to do. While none of the packages we looked at is anywhere near perfect or 100 per cent effective, we also feel that none of the paid-for options is sufficiently better than the free ones to warrant an outlay of hard cash, or the Editor's Choice.

We advise, instead, that you install at least two free tools. Coming in a close third was Spybot Search and Destroy, but our Recommended awards go to Microsoft Antispyware – provided it stays free after the beta test – and PCTools Spyware Doctor 3.2, both of which we felt were the better products on test here, although by no means the finished article. **PCW**

'While this type of software as a whole rates a "could do better", you do still need tools on your PC to keep you protected.'

SMART

ECS ELITEGROUP

Simply Smart

Digital Acceleration

Faster, easier, and smarter
All fun, done with one board

ECS motherboard awards:

Intel 945P EXPRESS CHIPSET
Supports Intel Pentium D Processor

Intel 945G EXPRESS CHIPSET

945 Series

PF5 EXTREME

Intel 945P · 64 bit support · Dual Core · SERIAL ATA 3Gb/s · Scalable HDGE Dual Graphic Engine · Intel RAID · IOC Instant Overclocking Controller

- What can your PC do for you? Featuring all the latest advanced technology, the PF5 Extreme is more than an efficient helper for your work productivity. It's also a marvellous platform for all kinds of entertainment. Try the PF5 Extreme for the ultimate 'sight and sound' digital experience.

www.redstore.com
sales@redstore.com
0870 870 4457

directfrom.com
www.directfrom.com
0870 870 4457

MAPLIN ELECTRONICS
www.maplin.co.uk
0870 429 6000

www.microdirect.co.uk
0870 444 4456

pcnextday
www.pcnextday.co.uk

©2005 Elitegroup Computer Systems. Co., Ltd. All rights reserved. All trademarks are property of their respective holders. ECS reserves the right to change, without notice, product offerings or specifications.

Network cameras

View live footage and monitor your home from less than £150. Will Stapley reviews five devices

Unlike standard webcams, network cameras can operate without the assistance of your PC. By hooking up the webcam to a router with a broadband Internet connection, you'll be able to monitor your home while you're away, set up alerts should someone walk in front of the camera and view live footage from any Internet-enabled PC.

Prices of these devices are now coming down to an affordable level and here we've rounded up five of the latest models. All but one are wireless, and a couple even let you move the lens remotely.

Of course, you'll need to configure your firewall to permit access should you want to view video over the Internet, and wireless connections always throw up interesting problems, but on the whole they're easy to use.

How to control your IP address

SINCE your network camera needs to know your IP address in order to broadcast footage online, Dynamic IP addresses (which are provided by most ISPs) will cause some problems.

To combat this, you'll need a Dynamic Domain Name Server (DDNS) service. Provided as standard with most network cameras, this service monitors the IP address given to you by your ISP and informs your camera of any changes.

If you've got a static IP address, you don't need to worry about DDNS services.

Axis 207

Price £230 **Contact** www.axis.com **Overall** ★★☆☆☆

The Axis 207 differs from the other models here in that it's a wired-only network camera. Don't write it off immediately though – even wireless models require cables in the form of the power supply.

During testing, video quality was stunning and easily the clearest of the cameras on test here. Refresh rates were also excellent, and even at 640 x 480, we were presented with smooth-flowing video. Bear in mind the refresh rate will drop drastically when viewing over the Internet using a standard broadband connection.

The biggest problem with the 207 is the lack of software. The Axis Camera Explorer software lets you manually record video, but if you want to make use of motion detection recording, you'll need to buy the Axis Camera Recorder utility, which costs a staggering £400.

The Axis 207 provides clear video and a free DDNS service (see box above). But at £230, without recording software, it doesn't compare well against the competition. Axis is launching a new wireless model soon.

D-Link DCS-5300G

Price £399 **Contact** www.dlink.co.uk **Overall** ★★★☆☆

The plasticky shell of the DCS-5300G from D-Link doesn't give a great first impression, but if you're looking to monitor a large area, its remote pan and tilt lens will appeal. Able to pan 270° horizontally and tilt 135° vertically, you'll be able to move the lens via the web-based interface.

A microphone and speaker output let you set up two-way audio communication, although it's worth remembering that you can't place the DCS-5300G outside.

D-Link doesn't provide a DDNS service with this camera, but it does offer support for three DDNS providers – TZO, DHS and DYDNS. The latter is free, the TZO costs $25/£14 per year, and DHS is $5/£2.70 per year, but these services are no substitute for a free DDNS service offered by the manufacturer of your network camera.

Viewing angles aren't great – the relatively long focal length of the lens restricts the field of view considerably. The DCS-5300G is more expensive than we expected, but the free-moving lens is a great feature.

Linksys WVC54G

Price £149 **Contact** www.linksys.com **Overall** ★★★☆☆

Personal Computer World GREAT VALUE

Linksys needs to consider a new design for its WVC54G. Bulky and unattractive, you'll find it hard to hide away the camera in your lounge. Worse still, the base won't sit flush if you're using a wired connection, since the Ethernet cable juts out from the bottom. Linksys has put an LCD screen on the front of the camera, but all this does is display the current IP address of the camera.

Design issues aside, it didn't take us long to get the WVC54G up and running. The lens can be swivelled and the focus changed, although both of these are manual adjustments. An internal microphone, along with an external microphone option, allows for one-way communication.

Image quality isn't great – objects more than four metres away looked blurry and we had to play around with the colour adjustment to get a semi-lifelike video.

A final gripe is that Linksys only provides a one-year trial of the Sololink DDNS service – usually costing $20 (£11) per year.

Despite its drawbacks, you can't deny that £149 is a very low price for a wireless network camera, making it a good budget buy.

Panasonic BL-C30

Price £289 **Contact** www.panasonic.co.uk **Overall** ★★★★☆

Personal Computer World EDITOR'S CHOICE

First reviewed in the September issue, we were looking forward to seeing how the BL-C30 fared against the other four cameras here. In terms of design, it's one of the more compact models and installation didn't cause any problems.

Although the lens can be moved, it's not nearly as flexible as D-Link's DCS-5300G. But, unlike D-Link, Panasonic provides free use of a DDNS service for those with dynamic IP addresses.

No audio features are included, so it's a video-only service. The quality of the video is better than Linksys' effort, but nowhere near the quality of the Axis 207.

Unlike the other cameras, motion detection is performed by a heat sensor. This prevents events such as changes in light activating the camera, but it also means it won't detect movement if the lens is pointing through a window.

The image quality might not be as good as the Axis, but the BL-C30 is still a decent wireless camera. Useful features such as a moving lens and sophisticated motion detection make this a good all-round network camera.

Sony SNC-M1W

Price £279 **Contact** www.sony.co.uk **Overall** ★★★☆☆

Sony's SNC-M1W is the most corporate-looking model here, but the picture of two children and a dog in the setup menus shows that Sony is clearly aiming this camera at the home market.

Despite looking as if the lens moves, the SNC-M1W uses a fixed lens. However, during tests we found that the lens has the widest angle compared to the others on test, which will be of use if you need to monitor a large area. There's no manual focus, but unless you're planning to monitor subjects closer than 50cm to the lens, it's not something of concern.

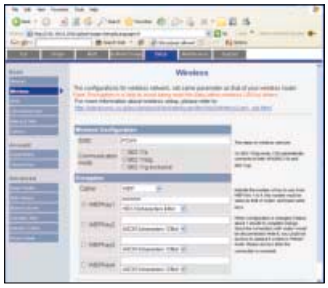
A free DDNS service is provided by Sony so those with dynamic external IP addresses will be able to access video over the Internet. Like the D-Link DCS-5300G, the SNC-M1W features an internal microphone along with external microphone and speaker outputs.

It's an expensive option, especially considering you can't pan the lens remotely, but it's easy to set up and feels and looks more robust than the other wireless models.

How to set up the Panasonic BL-C30

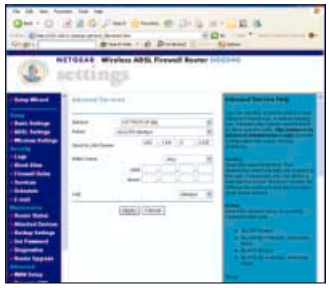
Step 1 Hook up the camera

Here, we'll show you how to set up the Panasonic's BL-C30 wireless network camera. Before using the wireless connection, hook up the camera via an Ethernet cable. Once the correct wireless settings have been entered, it can be switched over to wireless mode. Menus are accessed through a web browser pointed at the camera's IP address.



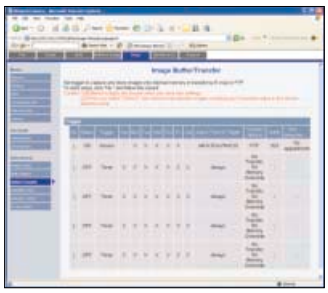
Step 2 Configure the firewall

After selecting which port the camera will use, you'll need to set up port forwarding on your router. On the Netgear DG384G (used in this example) you'll need to set up a new service for port 80 and then define a new firewall rule to direct traffic sent on port 80 to the IP address of the network camera.



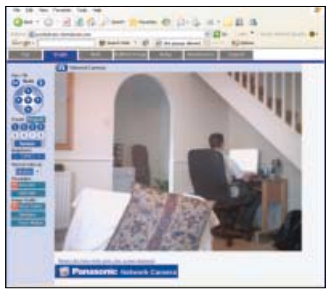
Step 3 Set up the alarms

As with the other models, you can set up the Panasonic BL-C30 to email you if the motion detector is triggered. The process is a bit long-winded with the BL-C30, but there are plenty of options, including sending images to an FTP site and specifying what times the motion detector should be activated.



Step 4 View over the Internet

The BL-C30 comes with a free DDNS service via Viewnetcam.com, allowing you to check live footage from any PC with an Internet connection. Enter the Viewnetcam.com domain provided and you're away. Should you have a static IP, just enter your IP address followed by a colon and the port your camera is using.



For the best network camera prices go to www.pcw.co.uk/bestprices

Network cameras

MANUFACTURER	AXIS	D-LINK	LINKSYS (PCW GREAT VALUE)	PANASONIC (PCW EDITOR'S CHOICE)	SONY
Model name	207	DCS-5300G	WVC54G	BL-C30	SNC-M1W
Price inc VAT	£230	£399	£149	£289	£279
Telephone	0870 162 0047	020 8731 5555	0800 068 0327	0870 907 0357	0870 6060 456
URL	www.axis.com	www.dlink.co.uk	www.linksys.com	www.panasonic.co.uk	www.sony.co.uk
SPECIFICATIONS					
Resolutions	640 x 480, 480 x 360, 352 x 288, 320 x 240, 240 x 180, 176 x 144, 160 x 120	704 x 480, 352 x 240, 176 x 120	640 x 480, 320 x 240, 160 x 120	640 x 480, 320 x 240, 160 x 120	640 x 480, 320 x 240, 160 x 120
Wireless	✘	802.11g	802.11g	802.11g	802.11b
Horizontal pan (degrees)	N/A	+/-135	N/A	+/-50	N/A
Vertical tilt (degrees)	N/A	+90/-45	N/A	+10/-40	N/A
Sensor	1/4in Cmos	1/4in CCD	1/4in Cmos	1/4in Cmos	1/4in Cmos
Focal length (35mm equivalent)	4mm (45mm)	6mm (68mm)	4.48mm (51mm)	4mm (46mm)	3.7mm (42mm)
Lens/Focus	f2/Manual	f1.8/Manual	f1.5/Manual	f2.8/Fixed	f2/Fixed
Digital zoom	4x	4x	✘	✘	2x
Microphone	✘	✔	✔	✘	✔
Speaker output	✘	✔	✘	✘	✔
Compression	Mpeg-4, Motion jpeg	Mpeg-4	Mpeg-4	Motion jpeg	Mpeg-4
Wep encryption	N/A	✔	✔	✔	✔
Free DDNS service included	✔	✘ (3 options offered)	✘ (1-year trial)	✔	✔
Dimensions (w x d x h)	55 x 34 x 85mm	103 x 103 x 110mm	85 x 80 x 155mm	98 x 61 x 74mm	109 x 68 x 109mm
Weight	177g	408g	240g	170g	240g
SCORES					
Features	★★☆☆☆	★★★★★	★★★☆☆	★★★★☆	★★★☆☆
Performance	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆
Value for money	★★☆☆☆	★★☆☆☆	★★★★☆	★★★★☆	★★★☆☆
OVERALL	★★☆☆☆	★★★☆☆	★★★½☆	★★★★☆	★★★☆☆

MAKE YOUR BUSINESS LOOK THE BUSINESS.

INTRODUCING THE RIMAGE 360i™, from the world leader in disc publishing. This affordable digital desktop disc recorder and printer lets you design, burn, and print directly to CDs and DVDs. It's easy to install, and it gives you the lowest cost of ownership over the lifetime of the product. To give your discs a sharp image call for free: **0800 RIMAGE INFO (7462434636).**

RIMAGE 360i™

CREATE. BURN. PRINT.™

PEOPLE WHO KNOW BROADBAND CHOOSE PIPEX

At PIPEX we love our customers too. They consistently help us achieve superior ratings for speed, performance and service. They also tell their friends about us, which is why nearly 50% of new customers come from recommendations.

Whether you're new to broadband or looking to switch provider, join an ever-increasing group of delighted customers and take advantage of great new products like PIPEX Start - just £14.99 a month with Free calls!

- Free modem and connection
- No 12 month contract*
- Choice of speeds up to 2Mb
- PIPEX Xtras loyalty programme

Broadband up to 2Mb

plus 500 Free mins of National & Local Calls every month†

£14.99 a month

1Gb monthly usage included, upgradable for just 90p per additional 1Gb.

Switch to PIPEX and get up to 1 month Free
See www.pipex.com for details

www.pipex.com

PIPEX®

Broadband is subject to availability. BT or similar line required. Free setup and free connection equipment applies to new customers only. Prices include VAT and are for payments by Direct Debit (otherwise add £1). Terms & conditions apply, see www.pipex.com *A cancellation fee of £58.75 and modem fee £20 (where applicable) applies to services with free set-up should you cancel within first 12 months. †Local and National numbers starting with 01 and 02.

The great paper chase

Using photo paper supplied by your printer's manufacturer can be expensive and there are cheaper options. Terry Relph-Knight pitches third-party alternatives against branded paper

ON TEST

100 Fujifilm
Jessops
Jet Tec
Kodak
101 PC World
Ryman

101 Altering settings and using test images to get the best print results
102 White, whiter, whitest: How colour printing works
103 Features table
Let the printer drivers take control
104 Lab results
105 How we tested
Editor's Choice

'Even the casual snapster can print photos at home. But should you use the printer manufacturer's own-brand photo paper or third-party options?'

You can now buy inkjet colour printers for less than £80 that can produce up to A4-format photo prints of astounding quality. Coupled with digital cameras, this means even the casual snapster can print photos at home. But should you use the printer manufacturer's own-brand photo paper or third-party options?

In this test we compare the options to see if you can save money or whether, as the printer manufacturers insist, it's a false economy to use third-party paper, as you will lose out on print quality. We're not covering the controversial issue of print fading in this group test, although we will be looking at this in a future edition. We tested using six popular, widely available low- and mid-priced inkjet printers.

Printer manufacturers don't make huge profits from selling printers, but they do with printer consumables. You realise this when you buy your first set of replacement, own-brand cartridges costing a large fraction of the printer cost.

Printer manufacturers respond to questions about the use of cheaper third-party consumables by saying they don't recommend them because they aren't selling you a printer, they are selling a complete printing system, where the printer driver, ink cartridges, printer and paper are all designed to produce the best-quality images possible with that group of components. Cynics sneer at this and we wanted to put these claims to the test.

Image quality and cost

We tested six brands of glossy photo paper against own-brand glossy photo paper from the three main manufacturers of colour inkjet printers – Canon, Epson and HP.

Where available, we used samples of the highest and lowest quality papers from both the printer manufacturers and the third-party paper suppliers. In some cases, where the bottom-of-the-range paper wasn't available, we used the next highest grade and found a clear difference even between the best- and next-best-quality papers. For example, there is a significant difference between the HP Premium Plus and HP Premium papers. In total, 17 papers were put to the test.

The help available to enable you to find the correct printer settings to use for each paper on each printer varied a lot (see the box 'Altering settings and using test images to get the best print results' on page 101).

Kodak provided the most support with its free Easyshare image-management software that incorporates the One-Touch printing utility, its online database of individual printer driver settings and even downloadable ICC colour profiles for its professional papers.

The Fujifilm and Jessops papers all included settings sheets, while the PC World, Jet Tec and Ryman papers did not. The instructions given in these sheets are fairly generic and not particularly detailed; for example, 'When using on HP printers, use the "Premium photo paper" selection with "best" print quality setting' – and they may not match exactly with the available options in current printer drivers.

Our test regime was intended to see what kind of results the average user could achieve without any specialist knowledge. It would have been an interesting exercise to see if any of our results with these papers could be improved, through either individual colour profiling or adjustment of the advanced settings in the print driver. However, this is very time consuming and would not be an option for most users.

Fujifilm

Fujifilm is one of the major photographic companies that have also been making inkjet papers for quite some time. Multijet Premium is its top-of-the-line paper and, although it did quite well, results varied a bit from printer to printer. Our viewing panel (see How we test on page 105) ranked it poorly on the Canon Pixma IP1500 (a four-ink printer) and on the HP Photosmart 7762 (a six-ink printer). Although we used the simple suggested settings, it is always possible that some experimentation could have improved the images from these printers on this high-quality paper.

The lower-priced Fujifilm Multijet Quality paper is designed for everyday use (a frequently used term for low-cost 'first proofing' papers) and, as such, it performs as you might expect with a generally low ranking. The exception is the high score achieved with the Epson C66. This, however, is more due to the printer, since the C66 is a vehicle for Epson's long-life, fade-resistant Durabrite inks and papers and has a fairly limited range of options for other paper types. It produced remarkably consistent prints across the whole range of papers, with only the Kodak papers looking noticeably poorer than Epson's own-brand Durabrite paper.

Jessops

Jessops is one of the three high-street retailers whose paper we tested, but the only one specialising in photographic equipment and consumables. Jessops only produces a single own-brand glossy photo paper, its Photo Inkjet A4 glossy, which, like the other retailers, it buys in from an unspecified source.

This paper did very well in our tests, apart from producing a rather light print on the Canon Pixma IP1500. It's certainly possible this could be improved through some experimentation with the driver settings.

Jet Tec

Jet Tec is one of the largest UK third-party ink and paper manufacturers and it sells a wide range of papers and replacement cartridges. Its Photo Gloss Premium is a new top-of-the-range paper, although it didn't do as well as its High Quality Gloss paper. This may be a printer driver settings issue, as Jet Tec doesn't provide settings advice for these papers.

The lowest ranking for the Photo Gloss Premium paper is on the HP Deskjet 3845, a four-ink printer images were oversaturated. It shares this problem with three other papers, which would suggest it is a driver-related issue on this particular printer model.

Jet Tec's other submission, the High Quality Photo Gloss paper, has been in the Jet Tec range for a bit longer than the Photo Gloss paper and generally puts in a better performance than the newer product. The most likely explanation is because it is happier with the 'Other photo paper' driver settings we used for our test prints on these two papers.

The only test print that provokes a comment for this paper is the rather light one that was produced on the Canon Pixma IP1500.

Kodak

Kodak is to be applauded for actively profiling its papers with as many printers as possible. This information can be used in three ways; through downloading and installing the Kodak Easyshare software, through manually setting the recommended values in the printer driver,

or through downloading individual printer profiles and printing via an application such as Adobe Photoshop that supports the use of ICC printer profiles.

Despite Kodak's efforts, its premium product, the Ultima Picture Paper glossy option didn't perform particularly well, with a wide variation of image quality across the six test printers, despite the wealth of settings support.

Prints on the Canon Pixma IP6000D and the Epson Stylus Photo R300 showed a noticeable yellow/green cast. Both of these printers use six inks for a wide colour gamut.

Kodak's other paper on test, the A4 Everyday Picture Paper Glossy, really is an 'everyday' paper – its cost is very low and it produces images that aren't much better than you'd get using ordinary photocopy paper.

It's a lightweight paper with a semi-gloss finish, rather like the clay glaze found on the better-quality web-offset printing paper used to print magazines. Using either the automatic settings from Kodak's One-Touch or the settings from its online database, it produced low-contrast, low-saturation prints on every printer.

PC World

The PC Line A4 Premium Glossy Photo Paper is another 'shop brand' from one of our three well-known high-street retailers, PC World, which only wished to submit one product for the group test.

The paper isn't supplied with any recommendations on printer driver settings, so our tests were all carried out using the 'Other photo paper' setting. It's a good-quality paper that produces above-average results, although, as with a couple of the other papers, it doesn't perform well on the HP Deskjet 3845. But even here the oversaturated image could be improved through a fairly simple adjustment in the printer driver.

Ryman

Ryman is the last of our three high-street retailers selling its own-brand paper, which it offers in several different weights and sizes and of different qualities.

The Professional Quality Ultra Heavyweight Photo Gloss is its top-of-the-line paper and, in the absence of any recommended printer driver setting instructions, it doesn't do too badly, although it produced oversaturated colours on the two HP printers.

Once again, some experimentation with the paper choice setting or individual adjustment of the driver's advanced settings might produce better results. The Ryman Photo Gloss paper is a lower-cost paper that produced unremarkable, mid-ranked results in most of our tests.

Altering settings and using test images to get the best print results

TO GET the best possible print results, you need to use exactly the right printer driver settings for whatever paper you're using. This is inherent in current printing technology and isn't an excuse dreamed up by the printer manufacturers in order to get people to buy their consumables.

Third-party paper suppliers have to try to ensure acceptable results with a range of printers and inks, often by making recommendations based on the paper settings available in each printer driver. As these paper options in the driver are designed around the printer manufacturer's own-brand paper, the simplest way of getting good image quality is to only use the paper recommended by the manufacturer of your printer – a point reinforced in our blind testing (see How we tested on page 105). With only two exceptions (Jessops' and Fujifilm's Premium paper in the HP Deskjet 3845), none of the prints using third-party papers was judged to be of better quality than the same print using the manufacturer's own paper.

If you're determined to use third-party paper, for whatever reason, you'll have to experiment with the advanced colour settings in your printer driver, but you may wind up producing a lot of test prints before arriving at suitable settings.

It might sound obvious, but good prints of consistent quality can only be achieved if you know what the printed image should look like. Ideally a print should be compared with the original scene but, of course, with most pictures this isn't practical and you end up using your (often fallible) recollections of a scene. However, it's possible to have a simple 'still life' for the purposes of setting up and testing a reproduction system (for most people the 'reproduction system' will include a digital camera, a PC, a monitor and an inkjet colour printer, plus the chosen printing papers). Such a still life should include objects with a range of colours and surface textures and have a good range of detail, highlight and shadow. Lighting is very important and shouldn't change, so artificial lighting is probably the best choice.

Alternatively, a high-quality test image can be used and fortunately there are a number of these available for download from the Internet. For example, the Hutcheson Consulting Screen test 3 from www.hutchcolor.com or the Digital Dog Printer Test File at www.digitaldog.net/tips/index.shtml (see screen, right).

Once you have a suitable test image file, it's still important to ensure it's reproduced accurately on your monitor. Perhaps one of the most important steps to producing high-quality, consistent images is monitor calibration and profiling. Most monitors are factory set to a colour temperature of 9,300K. This is a very blue-white setting that works well for general computing, but is much higher than normal lighting conditions, which are better represented by a colour temperature of 6,500K. Also, in an unprofiled state the hue of a mixed colour, such as yellow, will change on screen as it gets lighter or darker.

The professional, but expensive, solution is to buy a set of profiling tools and create your own colour profiles for the printer and papers you use. These profiles can then either be applied to images opened in suitable applications (such as Photoshop), and some printer drivers allow the use of colour profiles in their advanced options. Pantone (www.pantone.com) makes a range of print profiling solutions such as Colorvision Profiler Plus or Printfix. There are also the Profile Maker solutions from Gretag MacBeth (www.gretagmacbeth.com). To calibrate your monitor these companies also sell products such as the Colorvision Spyder 2 from Pantone (£140.94) or the Eye-One (£175.07) from Gretag MacBeth. Most of these products are available from specialist UK supplier Colour Confidence at http://shop.colourconfidence.com.

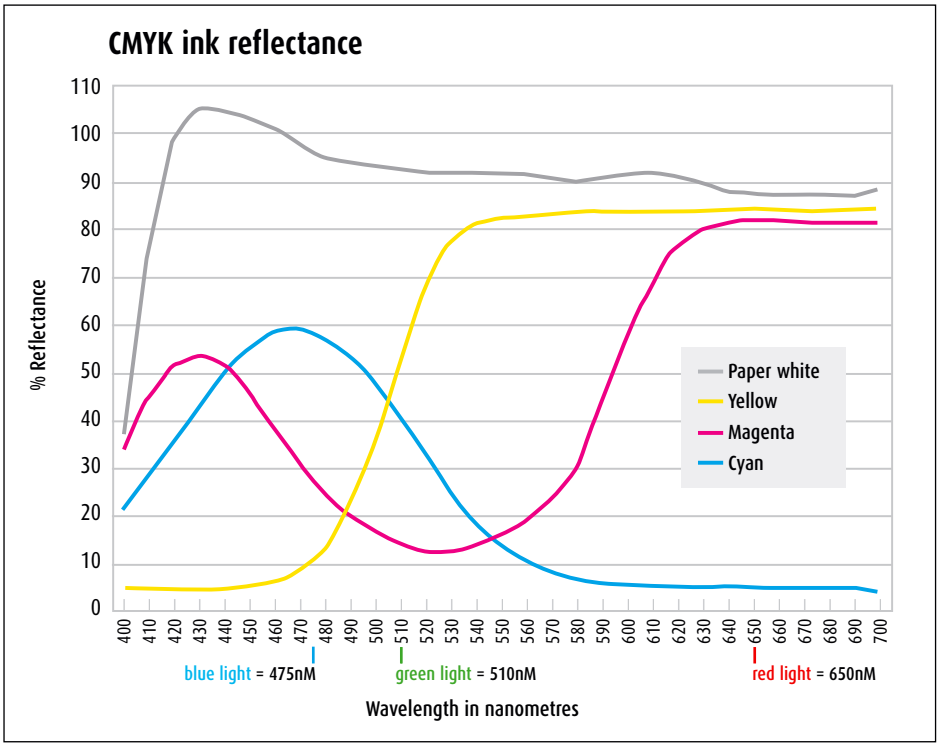
High-quality test images can be downloaded from the Internet to allow you to test the colours you get from your particular monitor and printer

White, whiter, whitest: How colour printing works

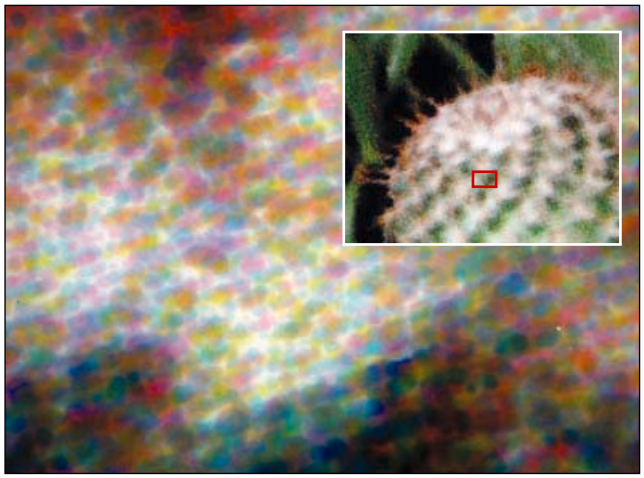
An insight into CMYK and why the whiteness of paper may change the printed result

COLOUR printing uses a subtractive colour process. It starts with the substrate or print medium, usually paper, which is 'white' – meaning that it reflects all frequencies of visible light more or less equally. Inks are applied to the paper surface, and these absorb some frequencies and reflect others (the absorbed light is converted into heat, warming the paper). Those frequencies that are reflected (that are left after the subtraction of the absorbed frequencies) we see as the inks' colours.

For example, as shown in the reflectance graph (right), yellow ink absorbs all the light at the blue end of the spectrum and reflects the frequencies in the green and red portions. The magenta ink pulls off a more interesting trick, absorbing only the green frequencies in the middle of the visible spectrum and reflecting the blue and red frequencies. Other colours are produced by printing various combinations of the three inks. For example, red is a printed combination of magenta and yellow. The magenta ink absorbs the green frequencies and the yellow absorbs the blue, leaving only red reflected.



As a result of the inks used in inkjet printing not being totally opaque, shades of colour are achieved by half-toning (where the paper is only partly covered with a pattern of small dots – see screen below), the 'white' reflection from the paper has a big effect on overall colour and contrast of the printed image. This is one reason papers behave differently and why two 'white' papers won't necessarily produce identical images from the same printer.



This magnified picture of an inkjet print shows the individual ink dots and half-toning patterns used to produce the range of colours. Inkjet inks aren't totally opaque and don't cover the entire paper surface, so the whiteness of the paper has a big effect.

It can be quite useful to just compare the whiteness of two papers. This is preferably done in daylight with the two papers close together, otherwise the quality of the incident light itself can make the papers appear a different colour. If you are considering trying a different paper and the alternative paper appears slightly pink, yellow or grey compared to your usual paper, you know immediately that pictures printed on the second paper will have a pink, yellow or grey cast.

Absorbency differs widely between papers. The half-toning method of producing colour shades depends on control of the size of the dots in the dot pattern. If the ink dots 'bleed' or spread more in one paper than another, the resultant colour shade won't look the same.

The subtractive colour process uses at least three inks, one in each of the secondary colours, cyan, magenta and yellow. If these inks were perfect, printing all three would absorb all visible light and produce a solid black, but in practice with real inks the best that can be done is usually a dark brown. Therefore, a black is also used, sometimes a pigment black for a denser black, to make the familiar CMYK (K is used for black so it's not confused with blue) set of the four-colour print process. With only four inks the range of printable colours is limited, because only a small range of shades can be produced using variable dot patterns for half-toning. Adding more inks such as a light cyan, a light magenta, a grey or even a red, blue or a green ink can extend the range of colour shades that can be printed or, in technical terms, extend the print gamut.

Six inks are often used in printers designed for printing photographic images and these inks help improve the definition of very pale colours and skin tones. Recent top-of-the-range photo printers even use as many as eight inks.

The difference in gamuts between a four-ink and a six-ink printer explains why an image printed in only four inks may appear to have more contrast and less detail and subtlety than the same image printed using six or more inks.

Inkjet photo paper

MANUFACTURER	PRODUCT NAME	URL	PHONE	PACK PRICE INC VAT (EX VAT)	NUMBER OF SHEETS PER PACK	PAPER WEIGHT (grams/sq m)	COST PER SHEET (pence)
Canon	Photo Paper Pro	www.canon.co.uk	01737 220 000	£7.36 (£6.26)	20	245	37
Canon	Photo Paper Plus Glossy	www.canon.co.uk	01737 220 000	£10.22 (£8.70)	20	270	51
Epson	Premium Glossy Photo Paper	www.buyepson.co.uk	08702 416 900	£11.97 (£10.19)	20	255	60
Epson	Durabrite Photo Paper	www.buyepson.co.uk	08702 416 900	£9.52 (£8.10)	20	200	48
Epson	Photo Quality Glossy Paper	www.buyepson.co.uk	08702 416 900	£5.36 (£4.56)	20	141	27
Fujifilm	Multijet Quality Paper	www.fujifilm.co.uk	020 7586 5900	£11.99 (£10.20)	30	180	40
Fujifilm	Multijet Premium Paper	www.fujifilm.co.uk	020 7586 5900	£9.99 (£8.50)	40	270	25
HP	Premium Plus Photo Paper	www.hp.com/uk	0118 986 8711	£12.99 (£11.06)	25	280	52
HP	Photo paper	www.hp.com/uk	0118 986 8711	£9.46 (£8.05)	25	175	38
Jessops	Photo Inkjet A4 Glossy	www.jessops.co.uk	0116 232 6000	£7.99 (£6.80)	20	260	40
Jet Tec	A4 High Quality Photo Glossy	www.jettec.com	01205 360 033	£9.99 (£8.50)	30	272	33
Jet Tec	A4 Premium Photo Glossy Medium Weight	www.jettec.com	01205 360 033	£8.99 (£7.65)	30	Not specified	30
Kodak	A4 Inkjet Ultima Picture Paper Glossy	www.kodak.co.uk	01442 261 122	£24.99 (£21.27)	40	270	62
Kodak	A4 Everyday Picture Paper Glossy	www.kodak.co.uk	01442 261 122	£6.99 (£5.95)	20	165	35
PC World	PC Line A4 Premium Glossy Photo Paper	www.pcworld.co.uk	0870 242 0444	£12.99 (£11.06)	30	180	43
Ryman	Photo Gloss	www.ryman.co.uk	0800 801 901	£9.99 (£8.50)	40	140	25
Ryman	Professional Quality Ultra Heavyweight Photo Gloss	www.ryman.co.uk	0800 801 901	£12.99 (£11.06)	20	280	65

Let the printer drivers take control

Epson's driver (left) has five quality options; and HP's driver (right) provides tools to help you enhance your photos before you print them out

PRINTER drivers have displayed an increasing sophistication over the years. Rather than discrete drivers for each printer in a manufacturer's range there is now often a generic driver that adapts to the specific printer on installation, or the range of drivers is based on common code and has a common look and feel. In addition to being split into basic and advanced user settings, many drivers now offer a single-button 'expert' system or a print wizard.

For example the Canon drivers' 'Print Advisor' button simplifies print tasks down into a choice of four: print a top-quality photo, print tables and charts, print a composite document or fast print all-back text.

Epson's drivers offer five quality options, complete with explanatory icons for draft, text, text & image, photo and best photo. The HP drivers have advanced photo-enhancement abilities (see screen above right), with automatic or manual options for red-eye removal, contrast enhancement, digital flash, smart focus, sharpness and smoothing.

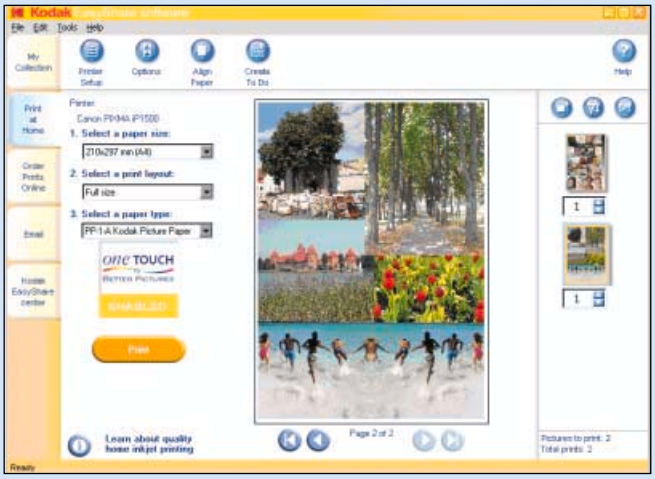
In addition to these simple guides, most drivers still have controls for individual print parameters if you dig deep enough. For example, the screen of the Epson driver (above left) shows controls for print gamma and saturation levels for the inks, plus a variety of other controls.

Using Kodak's free Easyshare tool

Easyshare is available for free download from the Kodak website. The pay-off for Kodak is that users have to register with the company, and Easyshare encourages use of its online printing service. However, it's a handy tool in its own right, even if you don't use Kodak paper.

On installation, Easyshare automatically scans your hard drive and creates 'Albums' of your images. Individual images can be added and new Albums created at any time, or a re-scan can be initiated.

Clicking on the 'Print at home' tab (see screen below) brings up the local printing page with access to Kodak's One-Touch printing feature. Providing the installed default printer is recognised, One-Touch does make it very easy to print to Kodak papers. If the installed printer isn't recognised, the 'One-Touch Enabled' logo doesn't appear and the yellow Print button is replaced by a blue 'Print Quality' button that just leads to the normal print driver options. It's a little confusing, but Easyshare does put up a warning message to say the printer isn't supported. Kodak says the database of supported printers is being added to all the time.



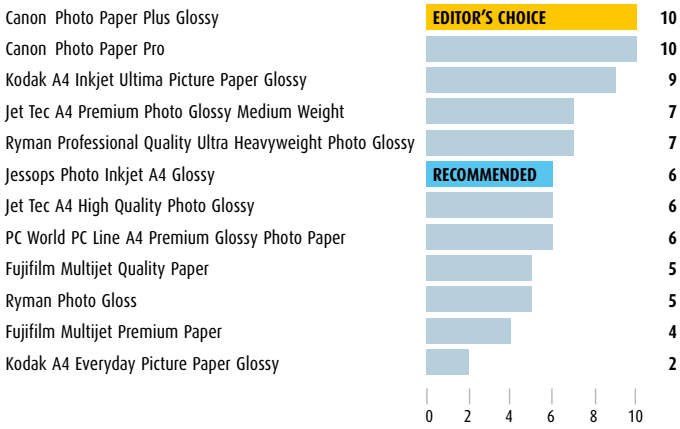
Easyshare's 'Print at home' tab makes it easy to print photos

Lab results

Six brands of paper were tested against the three main printer manufacturers' own brands on two of their printers. See next page for details of how we tested.

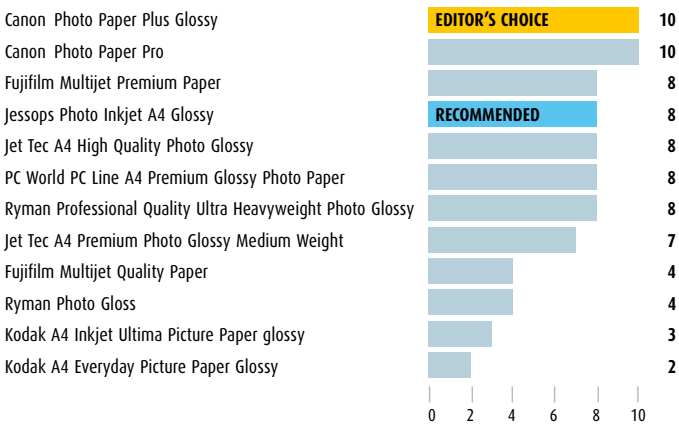
Canon Pixma IP1500 (4 inks)

Bigger is better



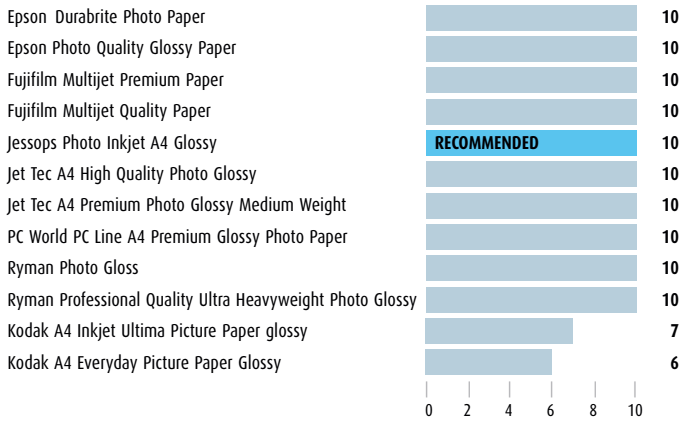
Canon Pixma IP6000D (6 inks)

Bigger is better



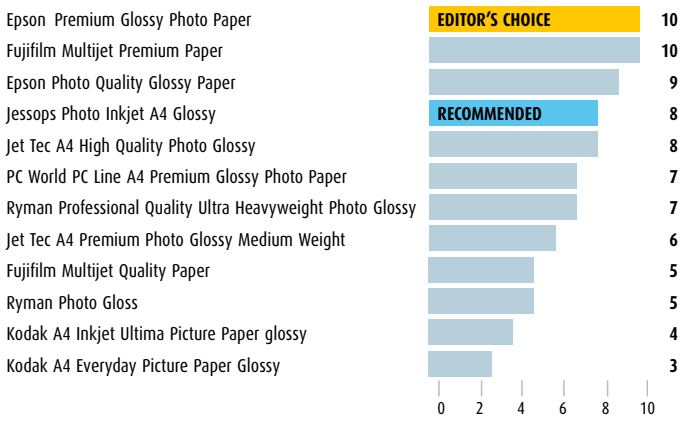
Epson Stylus C66 (4 inks)

Bigger is better



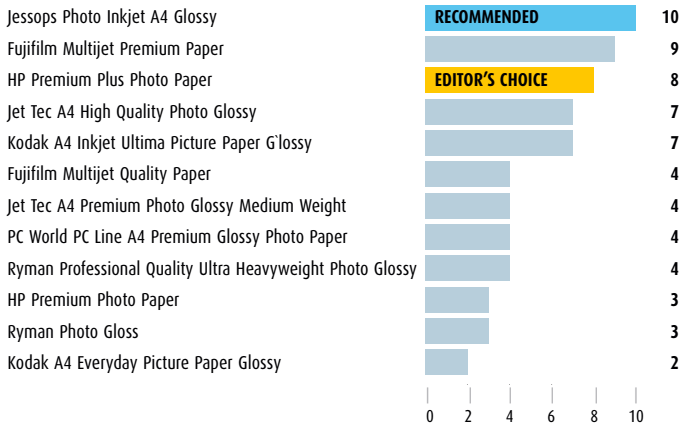
Epson Stylus Photo R300 (6 inks)

Bigger is better



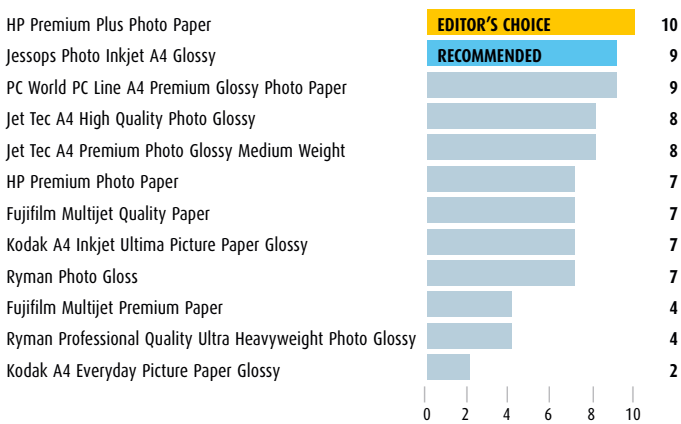
HP Deskjet 3845 (4 inks)

Bigger is better



HP Photosmart 7762 (6 inks)

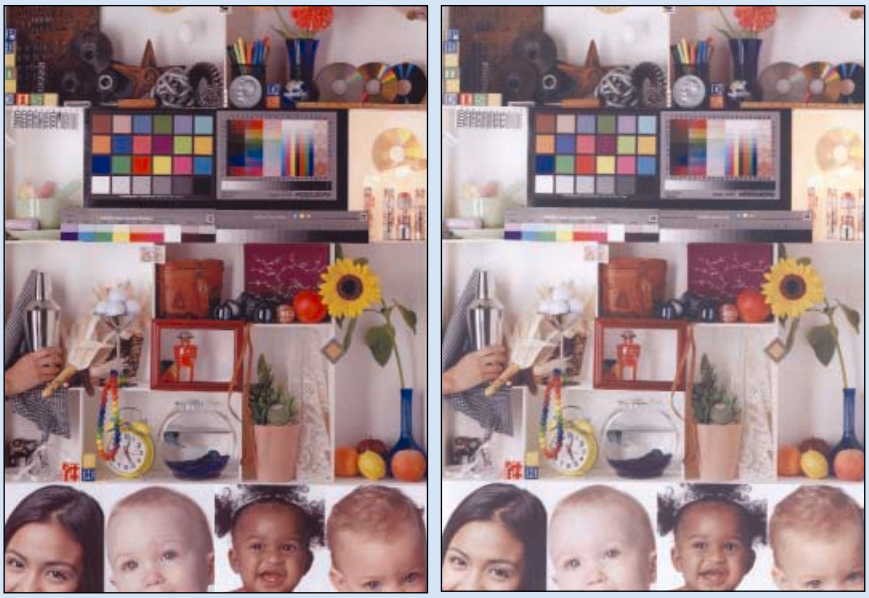
Bigger is better



	Kodak	Ryman	Fujifilm	Kodak	Ryman	Jet Tec	Fujifilm	PC World	Jet Tec	Jessops
Paper	A4 Everyday Picture Paper Glossy	Photo Gloss	Multijet Quality Paper	A4 Inkjet Ultima Picture Paper Glossy	Professional Quality Ultra Heavyweight Photo Gloss	A4 Premium Photo Glossy Medium Weight	Multijet Premium Paper	PC Line A4 Glossy Photo Paper	A4 High Quality Photo Glossy	Photo Inkjet A4 Glossy
Relative score	1	2	2.1	2.2	2.4	2.5	2.6	2.6	2.8	3

This table shows the calculated overall scores of the third-party papers, relative to the worst performer

How we tested



It is not possible to convey in scanned images the range of quality variation, as surface reflectance effects are lost. These two scans show the best and worst results from the HP Deskjet 3845

WE TESTED 10 glossy photo papers from six third-party vendors on inkjet printers from Canon, Epson and HP (see table). The printers were Canon's Pixma IP1500 and IP6000D, Epson's Stylus C66 and Stylus Pro R300, plus HP's Deskjet 3845 and Photosmart 7762. Each printer was fitted with the manufacturer's own-brand ink cartridges that came with the printer.

We tested the highest quality papers supplied by the manufacturer plus, where available, an 'everyday' paper.

Our test images were printed full-page from an RGB file via the Windows XP Print Wizard, using vendors' recommended printer driver settings for each paper where applicable, except for the prints to Kodak paper on the printers supported by the Kodak Easyshare One-Touch print utility. With those printers that were not One-Touch-supported, we used Kodak's recommended settings for the printer driver in the Windows Print Wizard.

Reference prints were made on each printer manufacturer's own-brand premium paper, as well as one other paper from its range – usually an 'everyday' paper.

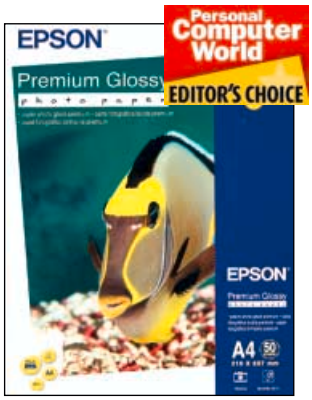
All the prints from each printer were laid out, with no means of identification of the paper brand, and sorted in order of image quality by our viewing panel comprising *PCW* editorial and labs staff. If the panel felt that two or more prints were of the same image quality, they were ranked together. We then assigned a top score of 10 to what we judged to be the best image for each printer and scored the other prints relative to that. The prints were then identified and their ranking and scores recorded. See the graphs on previous page for the full results.

We only assessed the prints for image quality and not for drying time, scuff resistance, water resistance or fading. If you've bought the DVD edition of *PCW*, you can find scans of the prints on the cover disc. Bear in mind, though, that the scanning and reproduction process can't give you a true feeling for the quality of the original prints.

Editor's Choice

Editor's Choice Canon Photo Paper Plus Glossy • Epson Premium Glossy Photo • HP Premium Plus Photo **Recommended** Jessops Photo Inkjet A4 Glossy

Canon Photo Paper Plus Glossy



Epson Premium Glossy Photo

HP Premium Plus Photo

Jessops Photo Inkjet A4 Glossy

Our viewing panel tests showed conclusively that each printer produced the best image quality when printing on own-brand paper, with only one very narrow exception for the HP Deskjet 3845 four-ink printer, where the Jessops Photo Inkjet A4 Glossy and Fujifilm Multijet Premium papers just sneaked past the HP Premium Plus Photo paper.

What did take us a little by surprise was the wide variation in the quality – some of the prints, such as those using Kodak's budget Everyday paper, were truly awful.

The four-colour printers didn't show a massive benefit from using the highest quality paper, but for the six-colour models it's worth buying the manufacturer's top-of-the-range paper.

Although we've found that it's possible to get image quality comparable to own-brand papers, the amount of work required to optimise your system for third-party papers is perhaps more than most users are prepared to do.

Given these results, we recommend using the manufacturer's own paper. We're giving three separate Editor's Choice awards to Canon's Photo Paper Plus Glossy, Epson's Premium Glossy Photo and HP's Premium Plus Photo.

Jessops Photo Inkjet A4 Glossy performed consistently well across most of the printers and, as it's also one of the cheapest papers at £7.99 for 20 sheets, it thoroughly deserves a Recommended award for giving impressive-looking results for those on a tight budget. Our only caveat with this is that we can't guarantee what results you'll get from printers we haven't tested. At such an affordable price, though, at least you won't lose much by giving it a try. **PCW**

Highspeed on air!

Energy thrust for your Wireless Network – with the 108Mbps Airplus XtremeG by D-Link.

- Up to 108Mbps
- 802.11g
- WPA & 802.1X
- Extended Range

Total 802.11 Super G ATHEROS

SUPER G 108Mbps

Wireless Solutions by D-Link. Wireless networking lets you work, play and access the Internet wherever you are without being restricted by wires. Your PC and laptop can be connected to share a printer, files and the Internet. You are free to stay inside, move from room to room or even go outside while remaining perfectly connected. It's simple, easy and provides high performance speeds giving you true mobility. D-Link offers an entire range of wireless networking products. Check out the NEW AirPlus XtremeG range now!

D-Link Building Networks for People

Learn more about getting into the flow: **www.dlink.co.uk**

dabs.com www.dabs.com

ebuyer www.ebuyer.com

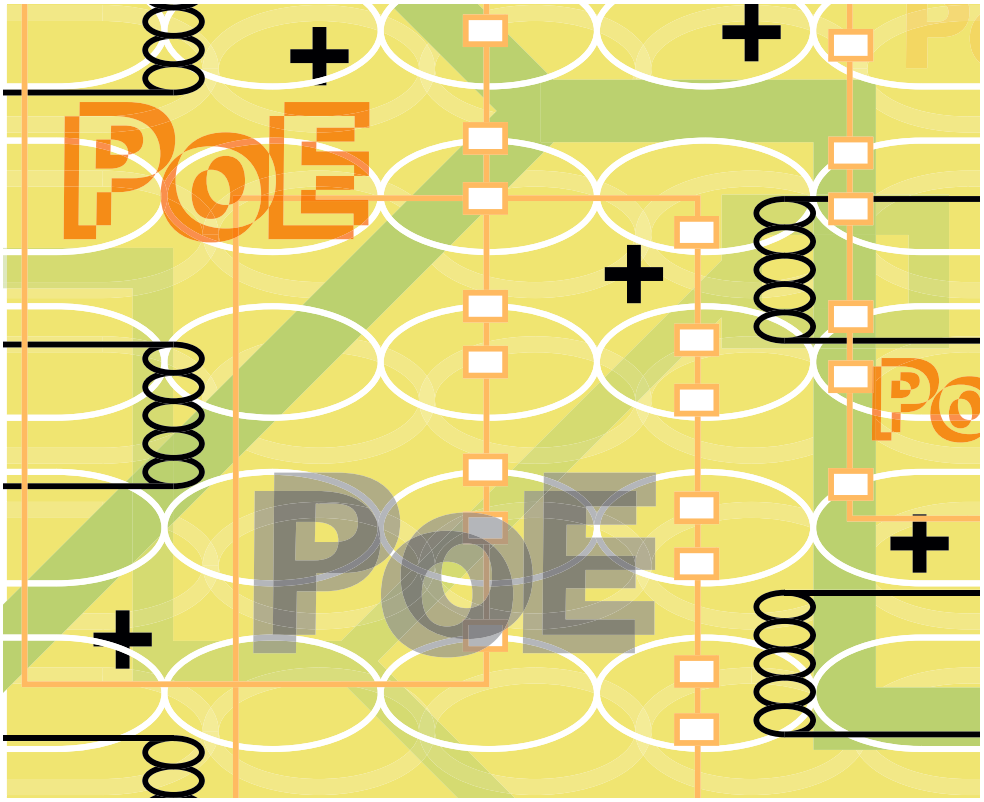
broadbandbuyer.co.uk Tel 0870 458 4801

Insight Tel 0800 333 333

MISCO IT solutions www.misco.co.uk Tel 0870 720 8720

PC WORLD Business Tel 08701 664 664

MicroWarehouse Tel 08705 550 000



ON TEST

108 Powerdsine 6024
HP Procurve Switch 2626-PWR
3Com Superstack 3 Switch 4400-PWR
Allied Telesyn AT-8524POE
Adtran Netvanta 1224STR

108 Twisted pairs for data and power
109 How we tested
Editor's Choice
110 Table of features

'PoE can solve many problems, not least those concerning the placement of devices such as IP telephone handsets, wireless Lan access points and IP network cameras'

Plugging into Ethernet power

Power over Ethernet makes installing a network more flexible and reduces wire spaghetti in the office. Dave Mitchell tests five switches that comply with the latest standard

Power over Ethernet (PoE), which allows a networked device to draw power from the same cable that delivers its data, has been a long time coming. The standard Ethernet cable with its unused wires is clearly capable of doubling as a power lead (see box overleaf) and there have been proprietary PoE implementations for some years. The IEEE 802.3af PoE standard was ratified in June 2003; but compliant products have only begun to appear this year.

PoE can be useful in local networks of all sizes, though early products have been targeted at the enterprise. However D-Link has launched sub-£500 products that show prices, if not specs, are drifting towards consumer levels.

The most obvious advantage of PoE is that it simplifies the installation of devices such as surveillance cameras, access points, Voice over IP (VoIP) phones and point-of-sales terminals that may need to be sited well away from mains power points. Wiring costs at greenfield sites can be minimised because fewer power sockets are needed.

The beauty of 802.3af is that it can be superimposed onto an existing network, or part of one: you can use existing Cat5 cabling and even (via adapters) conventional switches and client devices. And you can secure your entire network supply with a single UPS (uninterruptible power supply) system so that it stays live even during a power cut. The only proviso is that the length of a PoE link should not exceed 100m.

A major snag is that you can draw just under 13w per port, which is not enough to drive most computers (though UK PoE specialist DSP Design sells a range of 802.3af-compliant terminals

↘

3Com's Superstack 3 Switch 4400-PWR (left) has a wide range of uplink options

The widest range of expansion options was on Adtran's Netvanta 1224STR (below)

called Poets). An emerging spec will double the power per port, allowing the network to drive some notebooks and low-drain PCs, as well as point-and-tilt cameras that draw too much current to be used with the existing standard.

For this group test we asked leading Ethernet vendors to supply 24-port PoE-compliant switches. Cisco declined, saying its Catalyst switches are designed to function primarily with its own PoE client devices and would not come out well against the opposition.

Midspans and endspans

One of the devices reviewed here, the Powerdsine 6024, is not a switch in itself but a PoE-enabled conventional 24-port switch. You connect each output port of the legacy switch to a data-in port of the 6024, which injects power into its respective output port. Client devices are then connected as with a conventional switch.

The 6024 is known as a mid-span device, as opposed to the other four products reviewed here which are end-span devices and combine the functions of a switch and mid-span in one box.

You do not need to worry about plugging in non-PoE devices because all 802.3af switches contain detection circuits that cut off power if a client module is not compliant. The port then operates as an unpowered network jack.

Splitters such as the D-Link PWL-P50, allow non-PoE devices to draw power from the network provided their power requirements are suitable (see picture below). Splitters cost around £30, which compares favourably with the cost and hassle of setting up a separate power supply.

Splitters, such as this D-Link PWL-P50, allow conventional client devices to draw power from the network. The data and power on the PoE cable are separated and fed respectively to the unpowered network jack and DC power socket at the front of the device. This model allows you to choose between a 12v supply at a maximum 1amp or 5v at up to 2.5amp. The power lead needs to be wired for the correct polarity for the device you are using

Installation and configuration

Installing a PoE switch is no different to a standard Ethernet switch, and should be a case of plug and play. All the products we reviewed, with the exception of the Powerdsine 6024, can be managed using a standard web browser, which means that assigning an IP address needs to be simple as well. With most of the products this requires using the CLI (command-line interface) over a serial port connection and terminal emulation software such as Windows' Hyper Terminal. HP's Procurve Switch 2626-PWR device is a prime example, as administrators need only enter a single command at the CLI to access the main setup page where an IP address for the default VLan can then be configured or a DHCP server set up.

The Powerdsine 6024 uses the company's Powerview Java application, which needs to be installed first, along with a couple of Java scripts for SNMP access that must be copied across to the management system. Overall, though, none of the switches took longer than 10 minutes to install.

Expansion options

Expansion potential is an important consideration as all PoE switches, especially end-span devices, are likely to be placed at the edge of the Lan to directly service the PoE-compatible peripherals. As a result, high-speed uplinks to the network backbone should be considered to consolidate all these connections.

All the end-span switches cater for a wide choice of gigabit uplink options, with some offering fixed ports as standard. Although some have both copper and fibre mini-GBIC (Gigabit Interface Connector) ports, others, such as the Procurve Switch 2626-PWR, are dual-personality – if you use the copper port then the corresponding fibre port is automatically disabled. While 3Com's Superstack 3 Switch 4400-PWR and Allied Telesyn's AT-8524POE don't have any fixed uplink ports at all, they

Twisted pairs for data and power

The versatility of Ethernet cables and the 802.2af spec explained

ONLY two of the four twisted pairs of wires in a standard Cat 5 Ethernet cable are used for carrying data in 10/100Mbits/sec networks, so the other two are free to carry power. But the data pairs can also double as power leads, which is just as well because it allows PoE to be implemented on Gigabit Ethernet links using all four pairs for data.

The next version of the PoE standard will double the available power by using all four pairs. Powerdsine is already offering pre-standard modules delivering up to 39w per port by this method – the power available to the end device may be less due to line losses.

Oddly, the 802.2af spec does not care which pairs are used: client devices simply draw power from wherever it is available. The Powerdsine 6024 uses pairs 4/5 and 7/8 for power, and the other devices reviewed use pairs 1/2 and 3/6.

The power is, of course, DC, as if from a battery. It is delivered at 45v, much higher than the operating voltage of most networked devices, to keep the current low and the wires cool (PoE's 13w delivered at 1v would be enough to blow a 13amp fuse if it didn't melt the cable first). This makes PoE safer than the mains – it's much the same voltage as on a phone line – but means client devices need step-down circuitry.

If PoE goes mainstream it will be the world's first global standard power supply, and the only one using the same plug (the RJ45 network jack) worldwide. It is not quite the ideal of a universal smart power supply that simply delivers the power that a plug-and-play device requests, but it is getting there.

However, it looks as if travellers will be lugging around pocketfuls of power adapters for a few years yet. *Clive Akass*

Allied Telesyn's AT-8524POE provides good PoE information

You get a separate network management port on the Powerdsine 6024

How we tested

AS THE focus of this group test is on each product's PoE features, we chose not to run standard switching performance tests. Power management capabilities vary considerably across each vendor's products, so we wanted to assess the features available, such as power monitoring, alerting and prioritisation, rather than performance.

We connected a variety of PoE devices to each switch to see how they coped, whether they were able to identify each device and what facilities were presented for managing them. Our PoE test devices included IP network cameras from Axis Communications and wireless access points from 3Com and Proxim.

both have a couple of expansion slots. 3Com offers the best selection of uplink options, with modules that accept a variety of copper and fibre single-port modules.

Of all the switches we reviewed, Adtran's Netvanta 1224STR has the widest range of expansion options. Along with 24 PoE ports and a couple of dual-personality gigabit uplinks, its single expansion slot at the rear is designed to accept a range of Wan interfaces including E1, T1 and ADSL or ISDN and PSTN dial-up backup modules. As it is likely to be handling Internet-related traffic, it also comes with an integral stateful packet inspection (SPI) firewall. In addition, it includes quality of service (QoS) features specifically targeted at Voice over IP (VoIP), and a firewall geared towards handling Session Initiation Protocol (SIP) applications and communications sessions.

With peripherals relying on the switch for data and power, it's essential to consider the question of power fault tolerance. Most of the switches have a proprietary port at the rear to accept a redundant power supply, but products such as the Powerdsine 6024 and Adtran Netvanta will probably need an uninterruptible power supply (UPS) to be attached.

Switch management

While general switch management can be carried out either from the CLI or web interface on all the products, we were surprised at how few offered web access to PoE settings. Only 3Com's 4400-PWR included power configuration and monitoring features in its web server.

Considering HP's expertise in switch management, we found it odd that PoE management is unsupported in the Procurve's browser interface, with no options in the otherwise well-featured Procurve Manager utility either. Although basic, the Procurve's CLI does offer a good range of PoE features, such as the ability to enable or disable power on specific ports, view total consumption, monitor which ports are providing power and see the class of PoE device types connected. Three priority queues allow administrators to determine which ports maintain power when the total draw is getting close to the limit, and a power threshold can be set to trigger an alert if total consumption exceeds this value.

3Com's web interface, which is the same in all its Ethernet switches, is simple to use and features a new menu option for power settings located under the interface menu. From here, port power can be enabled or disabled, you can monitor the ports delivering power and identify current and peak loads in demand for each one.

Predefined profiles are assigned to ports that will guarantee a specific load, but these cannot be customised or added to, and they only cover a selection of 3Com's own PoE-compliant products. The switch also keeps a count of available and used guaranteed power, and if any PoE device fails, it can be configured to send an SNMP trap or email alert.

The feature-rich Adtran Netvanta is let down by a lack of administration tools. PoE on a per-port basis can only be enabled or disabled from the browser interface and all power management and monitoring is conducted from the CLI. One command shows a table with the power in watts being supplied to active ports but, other than the ability to switch PoE off or on for each port, that is it.

Allied Telesyn is another vendor that only supports CLI access to PoE settings, though the interface is easily accessible and provides a lot of information. Administrators can view global PoE settings or drill down to each port and see the power class of the attached device, while the power usage is shown in mW (milliwatts) volts and mA (milliamps).

Three priorities can be assigned to each port to determine which devices get turned off first if the total power draw reaches a critical level and a per port limit in mW can be set as well.

The Powerdsine 6024 features 24 port pairs to deliver power and data. A separate 10/100BaseTX port allows remote management via Powerdsine's Powerview Java-based web console, which provides good levels of access. The main interface is basic, offering only a simple graphic of the hub's front panel, but it does allow available power and consumption to be checked, maximum allowed power per port to be set and power supply prioritised to each terminal device. SNMP support also means that alerts can be issued to network management software if power thresholds are breached.

Turn over for the table of features.

HP's Procurve Switch 2626-PWR is easy to install and has a good web interface

Editor's Choice

Editor's Choice

3Com Superstack Switch 4400-PWR

Recommended

HP Procurve Switch 2626-PWR

IN GENERAL, we were somewhat disappointed with the PoE management and monitoring capabilities of many of the products on test.

We gave the Recommended award to HP's Procurve Switch 2626-PWR. Although monitoring and configuration options are only accessible via the CLI, it was a good product, if a little more expensive than most of the others included here. The CLI offers a decent range of features, it was easy to set up and the web interface is well designed.

The Editor's Choice award went to 3Com's Superstack 3 Switch 4400-PWR. For just over £1,000, firms get good features including easy installation and a neat web browser interface plus support for a range of fibre gigabit uplinks. PoE configuration options are above average and integrate well with 3Com's web management interface.

For the best PoE switch prices go to www.pcw.co.uk/bestprices

PoE switches

MANUFACTURER	3COM (EDITOR'S CHOICE)	ADTRAN	ALLIED TELESYN	HP (RECOMMENDED)	POWERDSINE*
Model	Superstack 3 Switch 4400-PWR	Netvanta 1224STR	AT-8524POE	Procurve Switch 2626-PWR	6024
Price inc VAT (ex VAT)	£1,085.70 (£924)	£1,408.83 (£1,199)	£1,093.93 (£931)	£1,287.80 (£1,096)	£846 (£720)
Contact	01442 438 000 www.3com.co.uk	07721 430 515 www.adtran.com	0118 920 9800 www.alliedtelesyn.com	08700 130 778 www.hp.co.uk	01491 682 247 www.powerdsine.com
Basic warranty	Limited lifetime	5 years	Lifetime	Lifetime	1 year
SPECIFICATIONS					
PoE type	End-span	End-span	End-span	End-span	Mid-span
Number of PoE ports	24	24	24	24	24
Speed	10/100BaseTX	10/100BaseTX	10/100BaseTX	10/100BaseTX	10/100BaseTX
Total power (watts)	Unspecified	370	400	406	400
Access to PoE settings	Web/CLI	CLI	CLI	CLI	Powerview
PoE disable/enable per port	✔	✔	✔	✔	✔
Power prioritisation	✔	✘	✔	✔	✔
Power thresholds	✘	✘	✘	✔	✔
PoE DISPLAY					
Device power class/consumption	✘/✔	✘/✔	✔/✔	✔/✔	✔/✔
Total power available/used	✔/✔	✘/✘	✔/✔	✔/✔	✔/✔
Average power used	✔	✘	✘	✘	✘
Peak power used	✔	✘	✘	✘	✘
PORTS					
Fixed ports	✘	2 10/100/1000BaseTX, 2 Mini-GBIC	✘	2 10/100/1000BaseTX, 2 Mini-GBIC	Not applicable*
Expansion slots	2	1	2	✘	Not applicable*
Expansion modules (ports)	1000BaseT (1), 1000BaseSX (1), 1000BaseLX (1), 1000BaseLH (1), Stacking	Wan interfaces	10/100/1000BaseT (1), 100BaseFX (1), Unpopulated GBIC	✘	Not applicable*
Auto MDI/MDI-X ports	✔	✔	✔	✔	Not applicable*
Stacking (max units)	16	16	24	8	Not applicable*
Redundant PSU option	✔	✘	✔	✔	Not applicable*
Forwarding mode	Store and forward	Store and forward	Store and forward	Store and forward	Not applicable*
Max bandwidth (Gbits/sec)	8.8	8.8	8.8	9.6	Not applicable*
MAC address capacity	8K	8K	8K	4K	Not applicable*
Port mirroring/trunking	✔/✔	✔/✔	✔/✔	✔/✔	Not applicable*
802.1d STP/802.1w RSTP	✔/✔	✔/✔	✔/✔	✔/✔	Not applicable*
802.1p prioritisation	✔	✔	✔	✔	Not applicable*
802.1x port access control	✔	✘	✔	✔	Not applicable*
Number of VLans	64	255	255	30	Not applicable*
OUT-OF-BAND-MANAGEMENT					
Ports	Serial	Serial	Serial	Serial	Serial
CLI/Telnet/HTTP/SNMP	✔/✔/✔/✔	✔/✔/✔/✔	✔/✔/✔/✔	✔/✔/✔/✔	✔/✔/✔/✔
Other	Network Supervisor	✘	✘	Procurve Manager	✘
VERDICT					
Pros	Web management interface provides full access to all PoE settings and monitoring facilities; extensive fibre and copper Gigabit uplink modules; visual power status and usage lights	Good build quality; integral SPI firewall; selection of Wan interface modules; good QoS facilities to support VoIP applications	Good levels of PoE information; three power priorities; plenty of uplink options; redundant power unit available	Easy installation; well-designed web interface for network traffic monitoring; optional Procurve Manager; copper and fibre Gigabit uplinks	Allows non-PoE switches to be retained; lower installation costs; good power controls; separate network management port; monitoring interface includes basic graphing of power usage
Cons	Power profiles aimed at 3Com's own PoE products	Not suited to businesses only requiring basic PoE capabilities; limited PoE management via CLI	No web browser access to PoE management and monitoring or fixed gigabit uplinks	All PoE monitoring and configuration options can only be accessed from the CLI	Management features need better presentation; cost close to the end-span devices
Verdict	This switch has a robust metal chassis and offers an excellent range of fibre and copper gigabit uplink options	Suited to businesses looking for an all-in-one switching solution that provides basic PoE facilities, Wan connections and firewall security	PoE management options are reasonable with power priorities supported, but access is by CLI only	Procurve switches have traditionally offered some of the best management tools, so it is disappointing that the CLI is the only means of accessing its PoE features	A good choice for injecting power into the Lan without having to ditch legacy non-PoE switching equipment
Features	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★☆☆
Ease of use	★★★★☆	★★★★☆	★★★☆☆	★★★★☆	★★★★☆
Value	★★★★★	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆
OVERALL	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆

* This device is used to give PoE capability to an existing switch

Personal Computer World

vnu labs

How we test

Performance testing is an important part of PCW's reviewing process and to obtain our authoritative results we use the UK's best PC testing resource – VNU Labs. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs.

One of the main reasons people upgrade their PCs is because their old model seems 'too slow'. But how do you tell whether the one you're going to replace it with is any faster? At *PCW* we take PC testing very seriously and we have the UK's best PC testing labs – VNU Labs – on tap to help us give you reliable, authoritative performance figures, to help you with your purchasing decisions.

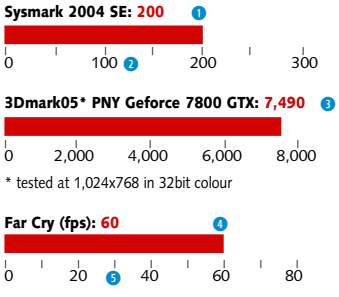
It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – if the core system is underperforming, you need to know before you part with your hard-earned cash.

In VNU's UK Labs, which is part of the European VNU Labs network, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. We are also a media member of the Futuremark Benchmark Development Program (www.futuremark.com). Listed below are the main benchmarks we use for testing PC systems and components.

- Bapco Sysmark 2004 SE – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark03 – a 3D graphics benchmark designed to test the performance of DirectX 8 graphics cards.
- Futuremark 3Dmark05 – the latest version of 3Dmark that tests DirectX 9 3D graphics performance.
- Ubisoft Far Cry – we use the Fort level timedemo to see how graphics cards perform in a real DirectX 9 game.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Bapco Mobilemark 2005 – used to assess the battery life of notebooks using real-world applications and usage scenarios.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

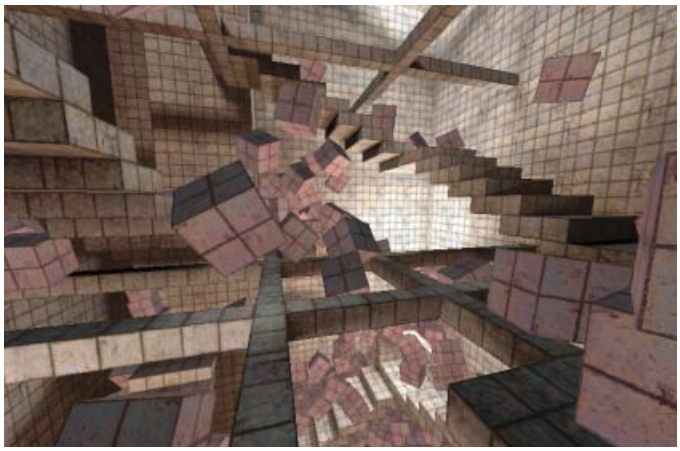
There's more information about our testing procedures and benchmarks on our Labs site at www.reportlabs.com/testbed/bguides/benchmarks.php.

Performance



1. A score of 200 indicates that the system is twice as fast as the reference PC
2. The reference PC (2GHz P4 512MB of Ram) scores 100
3. A Geforce 7800 GTX would score in the region of 7,490
4. A score of 60fps (frames per second) or higher is most desirable
5. A result of 30fps or above means the machine can produce playable frame rates at the tested resolution

3Dmark03 is used to test DirectX 7/8 graphics cards



PCmark04 measures memory, processor, graphics and hard drive performance

3Dmark05 pushes modern graphics cards to their limits

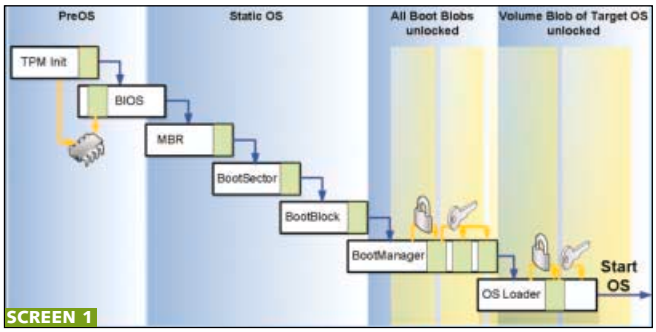
Room with a Vista

The new version of Windows boasts better security, a new interface, plus features such as a graphics system and copy protection. Jörg Geiger and Paul Monckton dig deep into the Beta version and compare it to XP, Suse Linux and Mac OSX

Microsoft has defined its goal clearly: Windows Vista, previously known by its code name Longhorn, is intended to become the company's best operating system ever and to finally dispose of Windows' bad reputation over security. To fully refurbish Windows, the programmers have been working on key features for Windows Vista, which is due to be released in the second half of 2006. Virtually every aspect of the system, from the user interface to the security settings and the driver models, will be altered. The important innovations include hotly debated features, such as the Avalon graphics system and Internet Explorer 7, as well as some little-noticed candidates such as the Metro document format and the PVP-OPM (Protected Video Path – Output Protection Management) copy-protection mechanism.

Windows Vista is supposed to be an all-round package of security measures, by which Microsoft does not just mean protection for the user. The term 'security' also encompasses Digital Rights Management (DRM), the built-in copy-protection mechanisms for music and movies. Microsoft's bosses are keeping quiet about this point, because if the plans for Windows Vista go through, you won't just need a new operating system, but also a complete new hardware setup.

This feature is based largely on those found in build 5048 of Longhorn, which was the pre-beta version of Vista aimed mostly at hardware developers and testers. Windows Vista Beta 1 for beta testers and MSDN subscribers was launched in early August, and we managed to get an early look at it to see what has changed since the pre-beta builds.



SOURCE: MICROSOFT

Secure Startup splits the boot process into several phases, which are dependent on one another. The real innovation is the protection, which kicks in before the operating system starts

Obviously, as Longhorn was effectively a preview version, which had not yet got to beta status, some of these functions were only partially implemented, or were missing entirely. Deep down, however, we could see interesting preparations for the upcoming versions. As ever with beta operating systems, things can change radically between builds, and there is no guarantee about which features will make it into the final shipping product. But as long as you bear that in mind, looking at these early versions is still a great way to peer inside Microsoft's mind.

Vista versus XP, Linux and OSX

You might be surprised by some of the new features planned for Vista. A few are simply improvements Microsoft is adding following years of complaints and criticism about Windows XP. A large portion are functions that are already present in other operating systems, and then there are the things that XP can already do – but only with add-on software. The comparison of Windows Vista with Windows XP, Suse Linux 9.3 and Mac OSX Tiger in the table on page 119 shows that there are innovations in Vista but they are comparatively rare.

Windows Vista technology in detail

Vista is meant to put an end to Windows' reputation as an insecure operating system once and for all. Immediately after turning on the PC, Secure Startup takes the helm and prevents any kind of access by external tools or by removing the hard drive. Behind Secure Startup is a hidden mechanism, which ensures a secure operating system start-up by using a combination of a secure Bios and an integrated cryptography chip (Trusted Platform Module – TPM). The real innovation is that Secure Startup only works with a TPM that meets the latest TPM version 1.2 specs. (www.trustedcomputinggroup.org).

When the chips are down

When you turn on a Vista PC, the first thing to start is the TPM, that is, the firmware belonging to the built-in cryptography chips on the motherboard. Computers without TPM cannot use Secure Startup. On powering up, the TPM chip checks the Bios and installed hardware. It calculates security checksums (using the Secure Hash Algorithm – SHA-1) for all the PC's hardware components, which it stores in its Platform Configuration Register (PCR). It also checks the system Rom, plus the hard drive's master boot record (MBR) and partition table, storing these hash values in TPM registers. The calculated checksums from these registers are then compared with the values stored on the chip from the previous boot. If there are any inconsistencies, the TPM will not allow access to the system partition. If they agree, the TPM considers its job done and the boot procedure can continue.

The MBR then takes control of the boot process. It specifies the active partition, loads the first sector into system memory and passes control to the boot sector.

For even tighter security, Secure Startup encrypts the entire system partition (see screen 1). The Full Volume Encryption (FVE) option offers more functions than Windows XP Professional's integrated EFS (Encrypting File System), which only encrypts files and folders – not a complete partition. The big disadvantage of this existing system is that files containing sensitive system data, such as the paging file, Registry and hibernation files, always remain unencrypted and can be read by hackers.

FVE, on the other hand, encrypts the whole system partition. The best solution is a combination of FVE and EFS. This allows important folders on data partitions to be encrypted using EFS, with the keys needed for decryption stored on the system partition, which is protected by FVE. If TPM boots the system without problems, then it decrypts the system partition.

Microsoft has fulfilled its promise to make the Windows Security Center something to take seriously. Secure Startup is not obligatory and can be turned off by users quite easily. However, you do need at least local administrator rights to do this. This means that users won't be able to circumvent the Secure Startup routines on their company notebooks behind the administrator's back.

New hardware prevents startup

The downside of the Secure Startup is that tying TPM to the hardware potentially prevents the system starting if, for example, you add a new graphics card or a Raid controller. In order not to lock out legitimate users from their own systems after upgrades of this type, Microsoft has come up with recovery measures: a form of 'failsafe' keys can be generated separately when setting up Secure Startup and, if there is a problem, it can be used to unlock the hard drive after hardware changes.

'Microsoft has fulfilled its promise to make the Windows Security Center something to take seriously'

Limited user rights

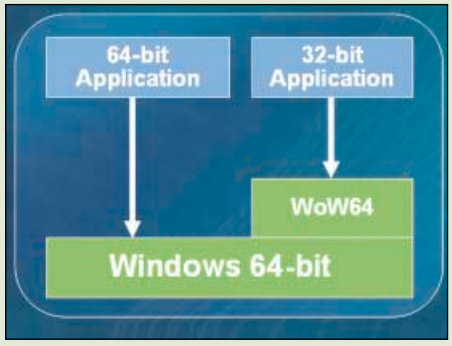
Windows XP doesn't really make full use of user rights as a security mechanism. The easiest and least secure thing to do is to always log on with administrator rights, which XP gives local users by default. For Vista, Microsoft is implementing a Least-privileged User Account (LUA). This gives a user with strictly limited rights the opportunity to enjoy the ease of use needed for day-to-day work – and Microsoft is being stricter with its

Windows Vista: 32 and 64bit versions

ALL FLAVOURS of Windows Vista (except Starter Edition) will be available in versions for 32bit or 64bit processors.

As with XP, the 64bit version of Vista can address more memory than its 32bit counterpart: 128GB instead of 4GB; 16TB of virtual memory instead of 4GB; and 64GB Ram per process, rather than 2GB.

While for Windows XP, the 32bit edition is the reference platform and the 64bit version is an extension, the main development work for Windows Vista has been carried out on 64bit machines from the start. The functionality of the 32bit and 64bit versions will be almost identical.



64bit Windows Vista uses WOW emulation to execute 32bit programs

programmers about ensuring that its software does not cause problems when run with restricted rights. The new version of Visual Studio 2005 is supposed to have some new tools for developing LUA programs. More details on this are due to be announced at the Microsoft Professional Developer Conference in September, which we will be covering on our website.

Tricks for old programs

There is also a secure solution for old programs that will not work with the restricted privileges of an LUA. The LUA Application Impact Management (AIM) is a sort of program manager that allows normal users, who do not usually have write access permission, a virtual view of protected system areas.

If a user with low security rights is running an application, which tries, for example, to write changes in C:\Program Files, AIM presents a virtual copy of this folder to the software and deletes this copy when the application is closed. This process is known as Copy on Write and means that an application can appear to write data, but other programs and services running on the same Windows Vista PC are protected from any alterations to files. So, if a virus or Trojan attempts to overwrite, say, the file C:\ProgramFiles\InternetExplorer\iexplore.exe, the source file will remain completely unchanged. In spite of this, AIM is only meant to be a last resort – Microsoft is actively encouraging developers to write programs that will run properly with LUA restrictions.

Protection for the administrator

Some processes, such as installing drivers, or making backup copies, will still require you to log in as a full administrator. For these cases, the LUA architecture provides a Protected Administrator (PA) status. This 'super user' status lets you log in with administrator privileges, yet still affords protection against malware modifying your system's configuration. PA allows applications to run in a protected administrator security mode, which is restricted in a similar way to LUA. Under PA, your web browser and email client are just as secure as under LUA. Only programs that have been specifically selected as being trustworthy can use the 'real' administrator privileges. So, for example, you could allow the backup program extended rights. Although PA does not offer watertight protection and the idea is not new, the level of security it promises is far higher than Windows XP and an unlimited administrator account.

Protection from the user

While Secure Startup, FVE and LUA have made real improvements in security, Vista still has some new tricks up its sleeve to protect contents from the user. Far-reaching consequences result from the copy-protection features for broadcast and disc-based 'premium content', such as that delivered via HDTV (High-Definition Television), HD-DVD and Blu-ray. Hollywood has put massive pressure on the computer industry to make it more difficult to use the comparatively open PC platform for making pirate copies of movies. The copy-protection mechanism in video DVDs was cracked years ago and the movie moguls have lost huge sums of money as a consequence; clearly they do not want this debacle to be repeated for the forthcoming DVD replacement. Similarly, the rights owners want to ensure that HDTV content, which will soon be available via digital satellite, cannot simply be copied to a PC for re-editing and illegal distribution.

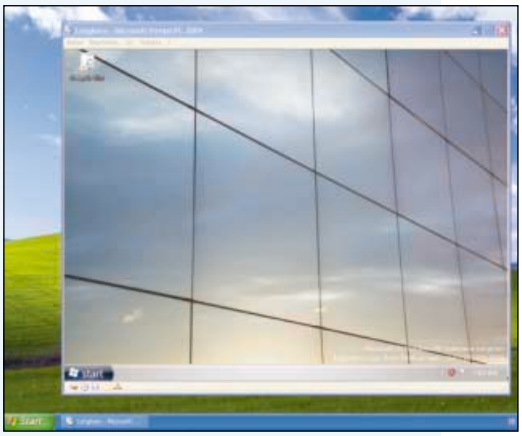
This means that those responsible are taking all measures possible to defend their content from attack at every level. A basic requirement is the need for protection from illegal software that might attempt to read and copy the premium content from Ram during playback. To prevent premium content from being ripped off, for example from the graphic card's analogue outputs, this content will only be available to devices that can provide evidence of being fitted with a copy-protection mechanism. This already exists: it is called HDCP (High-bandwidth Digital Content Protection), but it only works with digital HDMI or DVI interfaces. TFT monitors with a DVI connector, but without support for HDCP, might not be able to display premium content at all, or it will only display at a degraded quality. It will probably only be possible to watch lower resolution videos via the analogue VGA output. The TV-out interface will only be allowed to pass premium content if the output device is using, for example, the analogue Macrovision system and CGMS-A (Copy Generation Management System).

The output restrictions aren't just limited to video files: interfaces used for audio playback, which do not support copy

Power tip: Windows Vista, virtually

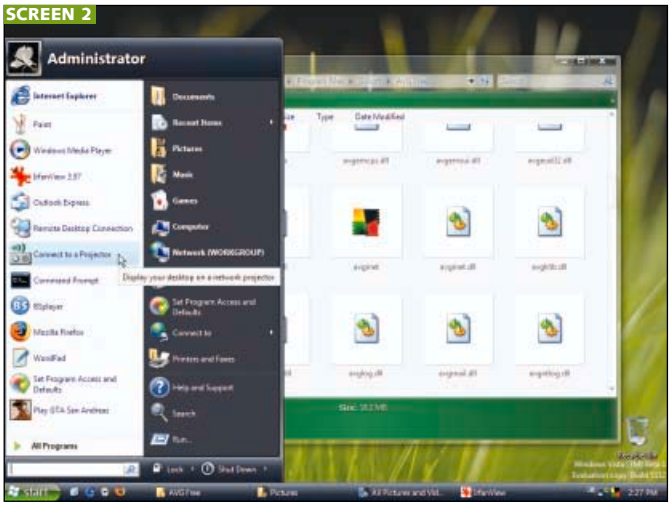
POWER users can install Vista on a virtual machine. The advantage is that you do not need a dedicated computer to try out the new version of Windows. VM Ware 5 has an experimental environment especially for the developer version of Vista, and Microsoft's Virtual PC can also handle the new OS.

The Beta 1 build does, however, have problems with virtual hard disks, but there is a workaround to ensure successful installation. Set up a virtual machine for Vista, but before you install it, place an XP-CD in the drive and use it to boot the virtual machine to the Recovery Console. Use the command format c: /q /fs:ntfs to format the virtual hard disk with the NTFS file system. Vista will now recognise the virtual hard disks.



Using Virtual PC, you can easily try out Vista functions under Windows XP

SCREEN 2



Vista's new-look Start menu contains an input box for direct searching. Note the new Remote Projector program

protection, such as S/PDIF (Sony/Philips Digital Interchange Format), will have to be capable of being turned off if the premium content guidelines require it. Low-level bus attacks also need to be stopped to prevent the theft of premium content via the PCI Express bus. Some content providers expressly forbid passing unencrypted content through the PCI bus to the graphics card, adding to Microsoft's list of problems looking for a solution.

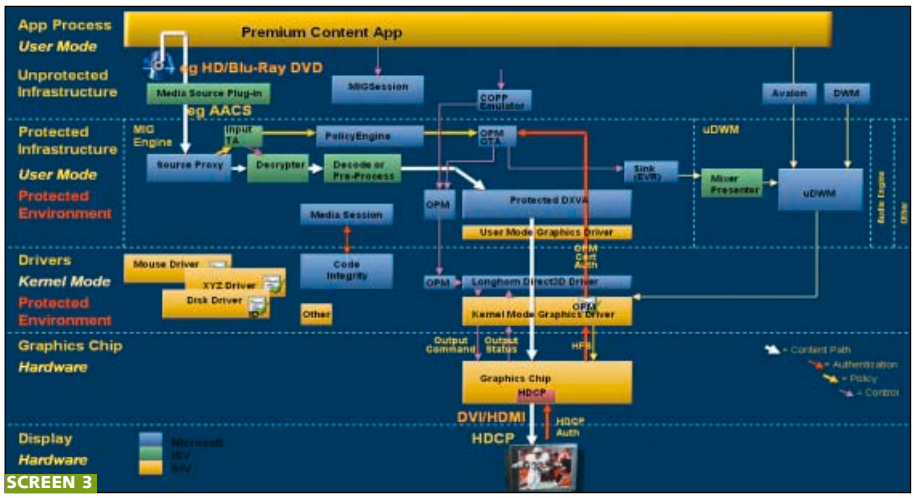
A digital fortress

To comply with the demands of the movie industry and rights holders, Microsoft has been working on a new copy-protection system, known as PMP (Protected Media Path) for the new version of Windows. Using a multitude of special mechanisms, as well as a special Protected Environment, the Vista PC is destined to become a veritable fortress for protecting premium content. Each item's embedded protection level data is processed by the MIG (Media Interoperability Gateway), which then decides whether or not playback is allowed.

Movie copying not allowed

Yet another acronym, PVP-OPM (Protected Video Path – Output Protection Management), describes the feature that is intended to put the digital handcuffs on movie pirates in Vista (see screen 3). It checks that the PC's video outputs meet the encryption requirements and monitors for signs of tampering. A series of authentication checks is carried out: the graphics card driver checks whether the card itself has been tampered with and whether it is authorised to play the content.

The operating system authenticates the driver, and the multimedia content itself checks whether the operating system has all the required security functions in place. A Vista PC will only play protected movies when the entire authentication process has finished successfully. If any part of the chain looks suspicious, PVP-OPM can simply stop playback or reduce the output quality.



SOURCE: MICROSOFT

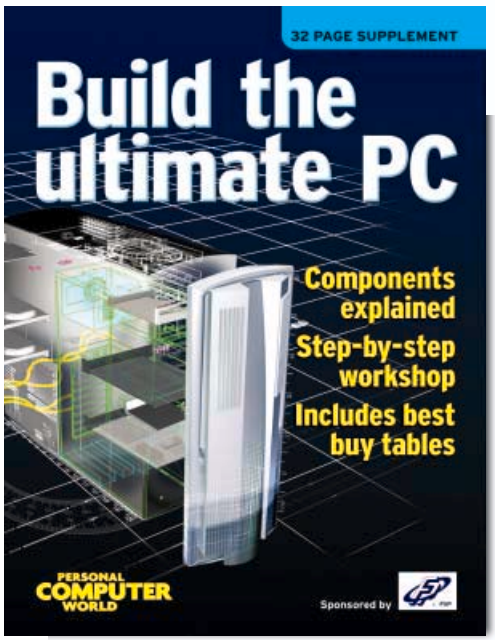
SCREEN 3

PVP-OPM consists of a complex interaction between the graphics card, drivers, the protected media area and the content protection guidelines

BECOME THE NEXT SPONSOR OF ONE OF OUR REPORTS

Increase awareness of your company with this amazing package including:

- Your logo on the front cover
- A page of sponsor's comment
- A generous number of adverts
- A PDF e-book of the report on the PCW cover disc
- Up to 1000 run-ons of the report
- 1-month solus sponsorship of a dedicated section of www.pcw.co.uk



Personal Computer World

For more details call Paul Harvey on 020 7316 9465 or email him at paul_harvey@vnu.co.uk

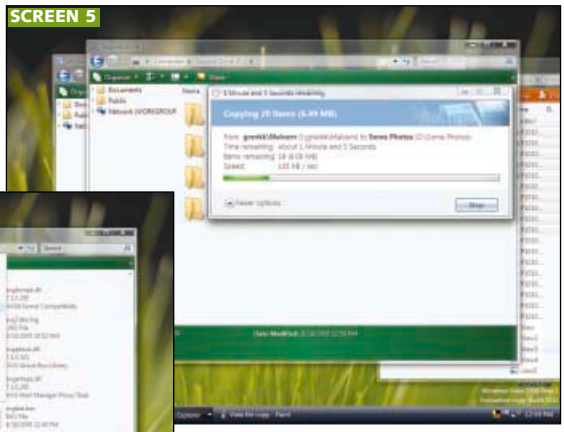
The equivalent of PVP-OPM for audio files in the Vista environment is known as Puma (Protected User Mode Audio). Under Windows XP, the audio engine runs in a highly privileged kernel mode, which will no longer be the case in Vista. The new audio engine has migrated to user mode and is supposed to be more robust and expandable.

To avoid any nasty surprises due to increased processing power, an exchange of individual protective components won't be possible. For example, if, in a few years (thanks to increased processing power), an encryption algorithm can be circumvented in real time, or if a module has been hacked, the output protection architecture will be able to invalidate the permissions granted to a module, such as a graphics card driver, which was previously viewed as trustworthy. Because of this, and in a similar manner to PKI implementations, affected modules end up on a global recall list. This, of course, means that for Vista PCs to be able to play premium content, they must be connected to the Internet in order to fetch an up-to-date blacklist.

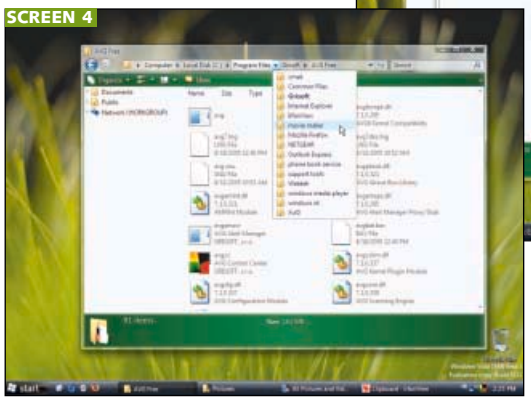
To protect the rights of content that reaches the PC from a TV broadcast, Microsoft has changed the interface for TV card drivers in Vista. The PBDA (Protected Broadcast Driver Architecture) controls the streaming of protected broadcasts from the TV card hardware to the operating system, including the encryption. It is even possible to imagine that the analogue output stream from a rented movie could contain copy protection or usage instructions, which Vista would then apply automatically. What we are seeing is the introduction of continuous content protection for the PC. Although great for content providers, it is this aspect of Vista that is no doubt the most controversial in the eyes of end users, not least for the hardware implications it has: are you prepared to buy a complete new PC just to be able to run Vista?

Right: Enhanced file copy animations provide more information, and in a clearer manner than Windows XP

SCREEN 5



SCREEN 4



Left: Navigation is now quicker and easier, with pulldown menus providing direct access to folders higher up the directory tree

NETWORK OFFER • NETWORK OFFER

A complete 5 user network with E-mail/internet from each PC, fully installed and cabled for less than £34 per week

Package includes

- Compaq P4 Windows 2003 server
- Router with Firewall for Internet and E-mail to desk
- Cat5 cabling for 12 points + 16 port switch
- 5 workstations with Windows XP
- Automated backup system
- 2 days on-site installation and configuration

Call us now on 01279 718693
more offers on our website
www.hardsoft.co.uk

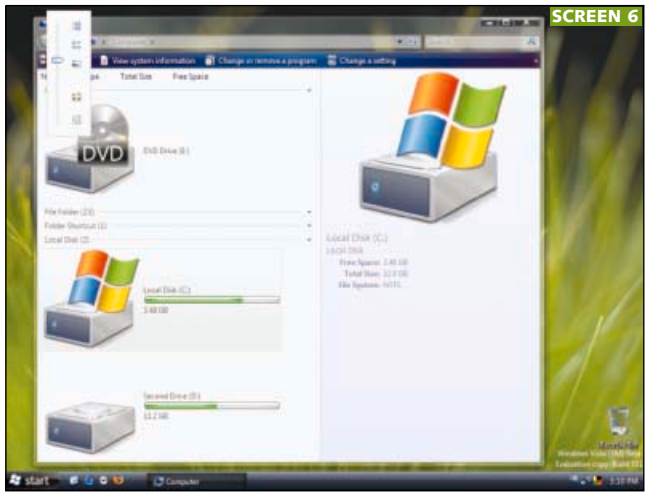
HARD SOFT
Hatfield Grange Farm, Hatfield Broad Oak
Bishop's Stortford, Herts. CM22 7JZ

VISTA'S NEW LOOK

A huge proportion of the new features of Vista are hidden in the depths of the operating system. But there is plenty in the new-look user interface that is of immediate benefit to users (see screen 2).

Microsoft has stated that many of the planned new features and user interface changes won't be released until Beta 2 of Vista, but in Beta 1 there is still plenty to be getting on with. As with any beta release, all these details may be subject to change before the final release.

From the first steps of installation to the opening up of the desktop, everything looks eerily familiar, but it is, in fact, very different.



Windows Explorer now allows you to present your data in a variety of new ways. Icons can be scaled smoothly from very small to huge sizes

Windows Vista questions answered

If you want to move to this new operating system, find out more below

Q Where can I download a trial version of Windows Vista?

A At present, there's no official trial version. However, Microsoft is distributing preview versions to partners, developers and selected testers. Beta 1 is only available to MSDN subscribers, but Beta 2 should be available for anyone who's interested to download free of charge in the last quarter of 2005.

Q What are the hardware requirements for Windows Vista?

A According to Microsoft: 3GHz CPU, 512MB of Ram, a 5GB hard disk, a DirectX 9 graphics card. *PCW* recommends rather more Ram, at least 1GB.

Q Does Windows Vista require activation?

A Yes, Windows Vista requires activation, just like Windows XP.

Q Which is the current Windows Vista build?

A At the time of writing, Longhorn 5112 is the most up-to-date 32bit version.

Q How many versions of Vista will there be?

A Starter Edition, Home Edition, Professional Edition, Media Center Edition, Small Business Edition, Mobility/Tablet PC Edition, Premium Edition. A special version for ultraportable PCs/laptops and a server edition are planned for 2007.

Q What are the most important new features?

A Microsoft is planning to include about 25 core features in Windows Vista. The most important of these are security related: Secure Startup, Full Volume Encryption (FVE) and Least-privileged User Account (LUA). However, Digital Rights Management (DRM) mechanisms are also very important in Windows Vista.

Q Is Windows Vista a pure 64bit operating system?

A All versions of Windows Vista except for the Starter Edition will be offered for both 32bit and 64bit systems.

Q When will Windows Vista be commercially available?

A According to Microsoft the planned date is in the second half of 2006.

Q How much will Windows Vista cost?

A There aren't any official prices yet, but at the Winhec developer conference in early 2005 the whisper was of prices similar to Windows XP.

Q Is Windows Vista more secure than Windows XP?

A Yes, Windows Vista is developed from the Windows Server 2003 SP 1 codebase and has new security functions.

Q Can hard disk content, films and music be copied and DVDs played under Windows Vista?

A Extensive digital content protection measures are an integral component of Windows Vista. Whether or not an mpeg2 decoder will be included is not yet certain as Microsoft naturally prefers its own WMV-HD format.

Q Are there Windows Vista drivers for my device?

A Windows Vista device-specific drivers aren't yet available. In many cases, drivers written for Windows Server 2003 or XP will work. However, this is by no means certain, and it will often be a case of try it and see if it works.

Q Will my software run under Windows Vista?

A The same goes for application software as for device drivers. There are not yet any Windows Vista specific programs; some programs will work, and others won't.

Q Does Vista support programs written for older versions of Windows?

A Windows Vista is supposed to be compatible with Windows 98, ME, 2000, XP and Server 2003, using compatibility layers, but 16bit Dos programs will no longer work unless run on a virtual PC.

Q Can you migrate your XP settings when you switch operating system?

A Yes, although whether the tools will be integrated, or whether you will need extra software from Microsoft is not yet known.

If your graphics card is powerful enough to support it, you will see a new look to Windows that goes beyond simple stylistic changes. Windows and dialogues now feature translucent 'glass' components that allow you to see whatever is beneath them through a soft blur effect.

There are new window animations, similar to those you may have seen in the Mac OSX system. You can also hover over a button and it will glow brightly, with its lighting effect extending beyond the edges of the window. Folders are colour-coded according to their contents: system folders are blue; media folders red; user folders green and so on.

This season's look is Aero

Windows Explorer has undergone many functional changes, mostly to do with organising and presenting your data. The familiar 'File, Edit, View…' menus are still available, but they are hidden by default. They are replaced with a 'command bar' containing context-sensitive buttons, similar in function to the familiar task pane of Windows XP, but taking up much less space (see screens 4 and 5).

Explorer's Address Bar now has much improved functionality. Rather than

'It is easy to apply Aero themes to applications and common controls, ensuring a consistent look and feel'

displaying a simple text field containing the location of the current folder, Vista provides a clickable button for each step in the directory tree. These buttons come with dropdown menus allowing you to navigate directly to folders further up the tree in a single click.

Windows Explorer now displays folder icons in many new ways. Where in Windows XP you would select a Thumbnails, Tiles, icons and so on from the View menu, Windows Vista provides a simple slider that gradually enlarges and shrinks icons as the Explorer window is reformatted in real time (see screen 6). There's also far more information presented about each file than before, allowing you to work with your files based on their content and metadata rather than simply their file names. For example, you could look at all the photos from a particular model of camera.

These enhancements form a small part of Microsoft's over-arching user interface design philosophy for Vista, called Aero. Clunkily reverse-engineered to stand for 'Authentic, Energetic, Reflective and Open', Aero is more than just a collection of pretty window furniture and icons. For end users of Vista, it is an entire user experience. For developers, it is a set of guidelines and tools governing everything from the way pixels are drawn through to (and we are not making this up) what feelings should be evoked in the user.

These guidelines are extensions of those already in place for Windows XP, but to make best use of the specific capabilities of Vista, a few additional steps need to be taken by developers. Put simply, these are based on avoiding hard-coding options, such as colours and window styles, and using Vista's built-in functionality to achieve the desired look by using the 'Theme painting' APIs (application program interfaces) to achieve the desired look.

In this way, it is easy to apply Aero themes to applications and common controls, ensuring a consistent look and feel. Microsoft claims as a user benefit the fact that applications written in this way will appear to be an extension of Windows Vista, rather than obviously discrete applications. Aero's Wizard Framework also allows developers to use the Aero style in their own dialogue boxes. This avoids scaring inexperienced users with a completely different- user interface when they open your application, but it may also lead them to believe they are using Microsoft's product rather than yours, which, depending on your viewpoint, could be either a good or a bad thing.

Virtually organise your data

Although Microsoft's much-vaunted WinFS database filesystem is now not going to appear in Vista, there are still many new features designed to help you organise your data more efficiently.

Virtual folders allow you to group items together based on their content, rather than their location in the usual hierarchical directory structure (see screen 7). Use the Windows search tool to find the files you are after, then refine and filter it based on a variety of metadata. Once the search window contains just the files you are looking for, you can save the search as a virtual folder. Opening up this folder in future will display the list of documents matching your previous search in a virtual folder. If the results of your search have changed in the meantime, the contents of the virtual folder will reflect these changes because the system re-runs the search each time you open the folder.

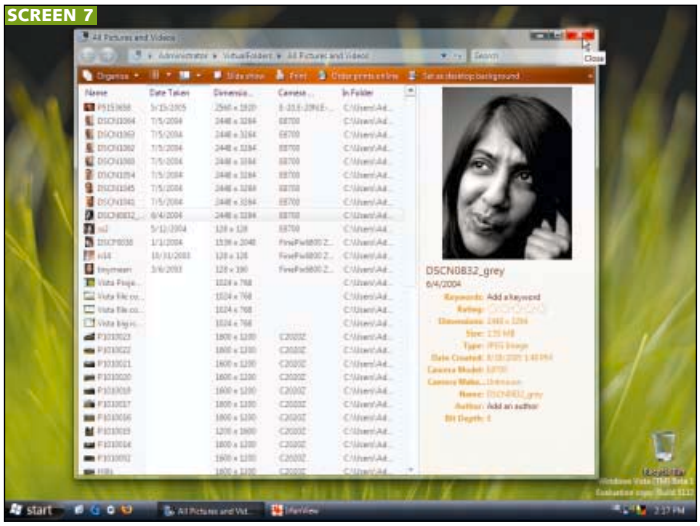
This is a great way of keeping things organised without having to carefully maintain a complex directory structure. It also allows the same document to appear in many virtual folders at once without the need for additional copies or shortcuts.

Vista provides a selection of virtual folders by default. If your files are disorganised, you will find virtual folders such as 'All documents' very useful. No matter where you have saved them, the 'All documents' virtual folder will always contain all your documents, ready to be sorted and arranged in whatever way you find most convenient. Other Microsoft-provided virtual folders automatically contain all your favourite music files or documents containing certain user-specified keywords.

The virtual folder is an example of Microsoft's integration of XML technologies into Vista. Rather than referring to a logical location on a hard drive or a network, a virtual folder is the result of a query to the Windows Search Engine.

The forthcoming Beta 2 of Vista promises to extend this search capability to Internet Favourites and RSS feeds. Other enhancements, mainly aimed at mobile users, include the ability to broadcast presentations wirelessly to projectors or other Vista users. Beta 2 will see this functionality folded into a 'meeting utility' that incorporates file transfer and chat. See over for a comparison of Vista with other OSs.

SCREEN 7



Virtual folders allow you to group and filter files by content, rather than physical location

Operating systems compared

	WINDOWS LONGHORN/VISTA	WINDOWS XP PRO SP2	SUSE LINUX 9.3 PRO	MAC OSX 10.4.1 (TIGER)
CPU/Ram/Hard disk space requirements	3GHz/512MB/6GB	300MHz/128MB/3GB	200MHz/128MB/2GB	G3-CPU/256MB/3GB
Support Multicore CPU/Multi-CPU	✔/✔	✔/✔	✔/✔	✔/✔
Virtualisation without hardware	✘	✘	✔	✘
32bit/64bit versions	✔/✔	✔/✔	✔/✔	✔/✔
File systems supported	NTFS, Fat32	NTFS, Fat32, Fat16	ReiserFS, Ext2, Ext3, XFS, JFSHFS	HFS+, UFS, Fat16, Fat32
Defragmentation/partition imaging function	✔/✘	✔/✘	✔/✔	✘/✔
Raid support	✔	✔	✔	✔
Compatibility layers/emulation layers	✔/✘	✔/✘	✘/✘	✔/✔
System configuration manager	✔	✔	✔	✔
Serial number/activation/registration	✔/✔/✔	✔/✔/✔	✔/✘/✔	✔/✘/✔
SECURITY				
User account types/user rights	✔/✔	✔/✔	✔/✔	✔/✔
User change without restart	✔	✔	✔	✔
Encryption for files/folders/partitions/drives	✔/✔/✔/✔	✔/✔/✘/✘	✔/✔/✔/✔	✔/✔/✘/✘
TPM support/DRM	✔/✔	✘/✔	✘/✘	✘/✔
Secure system start	✔	✘	✘	✘
Secure recovery/deletion of data	✔/✔	✘/✘	✘/✘	✘/✘
Backup functionality	✔	✔	✔	✔
Memory protection	✔	✔	✔	✔
Firewall/Anti-virus/Antispam/Intrusion Detection System	✔/✘/✔/✘	✔/✘/✘/✘	✔/✔/✔/✔	✔/✘/✔/✘
Local security warnings	✔	✔	✘	✘
System password/Network password	✔/✔	✔/✔	✔/✔	✔/✔
Emergency system	✔	✔	✔	✘
OPERATION				
Instant-on/Hibernation modes	✔/✔	✘/✔	✘/✔	✘/✔
Indexing	✔	✔	✔	✔
Hot patching/Automatic updates	✔/✔	✘/✔	✔/✔	✔/✔
Scripting/Shell	✔/✔	Limited/✔	✔/✔	✔/✔
Sync manager	✔	✘	✘	✔
Search help	✔	✔	✔	✔
Install Wizard for OS/User-defined installation/Unattended installation	✔/✔/✔	✔/✔/✔	✔/✔/✔	✔/✔/✘
Zero Configuration Wizard	✔	✘	✘	✔
Program Installation Wizard	✔	✔	✘	✘
Virtual directories	✔	✔	✔	✔
GRAPHICS AND MULTIMEDIA				
3D interface/Effects/Acceleration	✔/✔/✔	✘/✘/✔	✘/✘/✔	✘/✔/✔
Support for auxiliary displays/Multi-monitor	✔/✔	✘/✔	✘/✔	✘/✔
Virtual desktops/Widgets	✘/✘	✘/✘	✔/✘	✘/✔
Burn data CD/DVD	✔/✔	✔/✘	✔/✔	✔/✔
Video and DVD playback	✘	✘	✘	✔
Audio/Image management	✘/✔	✘/✘	✔/✔	✔/✔
Video editing/Audio processing	✔/✘	✔/✘	✘/✘	✔/✘
NETWORK AND INTERFACES				
WLan 802.11a/b/g	✔/✔/✔	✔/✔/✔	✘/✔/✔	✘/✔/✔
Bluetooth 1.1/2.0	✔/✔	✔/✔	✔/✘	✔/✔
USB 1.1/2/Wireless	✔/✔/✔	✔/✔/✘	✔/✔/✘	✔/✔/✘
Firewire 400/800/Wireless	✔/✔/✘	✔/✘/✘	✔/✘/✘	✔/✔/✘
IPv6	✔	✔	✔	✔
Remote desktop/Administration	✔/✔	✔/✔	✔/✔	✘/✔
Network Location Awareness	✔	✘	✘	✘

Power Can be a Beautiful Thing.

"When we introduced Nalu to the world for the first time, she had to be perfect. Our NVIDIA GeForce 6800 set a new standard for graphic realism that would be compromised if it wasn't supported by the finest components. That's why we use Antec power supplies for many of our reference and product launch systems. With anything less than the clean, stable power provided by Antec PSUs, our vision may have been diminished."

Tri Huynh
Senior Engineer, Corporate IT
NVIDIA

The Nalu demo image is ©2004 by NVIDIA Corporation. All rights reserved.

Antec. For when you rely on power for your very existence.

www.antec.com

Antec
The Power of You

dabs.com Insight MAPLIN MICRO DIRECT savastore.com a division of WATFORD electronics

PROGRAMMING CAN BE FUN with Microsoft's new low-cost programming tools. See page 147

VIRTUAL PCs How next-gen CPUs can boost productivity. See page 149

Practical advice from the industry's experts

EDITED BY KELVYN TAYLOR
ktaylor@vnu.co.uk

HANDS ON

REAL-WORLD SOLUTIONS

A warm welcome to the new-look Hands On section, where you'll find some of the very best hints, tips and practical advice available. If you're reading *PCW* for the first time, this is the section of the magazine that taps into the vast combined experience of our writers to give you advice on real-world issues and problems, covering pretty well any PC-related topic.

For example, this month we cover subjects ranging from underclocking a processor to programming a webcam using Visual Basic, plus there's a fascinating special feature looking at virtual PC technology.

Existing readers will be happy to know that we haven't changed any of the content or the contributors; we've just tried to make the section even easier to read and navigate, and hence even more useful. I'd be more than happy to hear your feedback about the new design: just drop me an email at ktaylor@vnu.co.uk.

You can also send comments and queries to individual contributors using the email links at the top of each section.

CONTENTS

122 QUESTION TIME
If you have a problem, let our experts take a look and find a solution

126 HARDWARE
Keep track of system or media information via a graphical character-based display

128 PERFORMANCE
The benefits of slowing down your CPU explained

130 WINDOWS
Learn how to create your own shortcut toolbar with 'new document' links

132 LINUX/UNIX
Automating mundane tasks with scripts

136 DIGITAL IMAGING & VIDEO
Learn how to use the digital filters introduced in Photoshop CS to control the colour and tonal properties of your images

138 WORD PROCESSING
Restore features developers have removed

139 SPREADSHEETS
Make use of the built-in Analysis Toolpak in Excel to investigate a set of data the easy way

140 WEB DEVELOPMENT
Start rolling out your own news feed with RSS 2

143 NETWORKS
The hardware, software and practicalities of VPN technology explained

145 DATABASES
Generate large reports with flexible queries, and we help you find your favourite features

147 VISUAL PROGRAMMING
Creating 'roll your own' programs is a breeze with Microsoft's new low-cost programming tools

149 VIRTUAL PCS
Future CPUs will make it practical for everyone to run virtual PCs, where one PC emulates many systems.

28 PAGES OF...

- ADVICE
- TOP TIPS
- TECHNIQUES
- WORKSHOPS
- HARDWARE SOLUTIONS
- SOFTWARE SOLUTIONS
- Q&A

Far left: Blur filters let you focus attention on specific details – find out more in the Digital imaging column

Left: Code your own card game with the help of the visual programming article

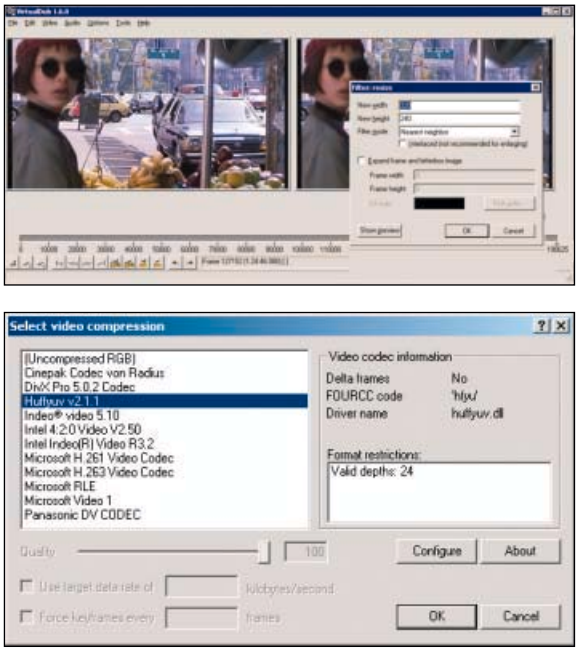
Advice from our experts

If you have a question, *PCW* can help find the soution

DIGITAL IMAGING

Seeking input

Q My son-in-law bought a Sony Handycam DCR-DVD91E from Comet a year ago to film our first grandchild. Subsequently, nobody has been able to help him find a video-editing program that will handle files from the mini DVD disc it uses. I believe the problem format is called vro. He bought a new computer specifically to do this editing. While it reads the mini DVDs and displays the unedited footage perfectly well, Adobe Elements could not input the files at all. Could you please tell us whether there are any video-editing programs that will input these files straight from the mini DVD placed in the PC's drive so we can work on them?
James AR Willis



Virtualdub will let you convert vro files to mpeg-2 or DV-avi formats

A The vro files are a DVD-Ram flavour of the mpeg-2 video format which can be edited in many applications, including Adobe Premiere Elements 1.0. Try copying the vro files to the hard drive and renaming the .vro extension to .mpg. If you're lucky, this may work.

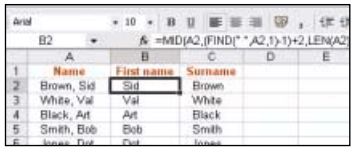
If not, you'll need to convert the files, either to mpeg-2 or, better still, to DV-avi files which any video editor, Premiere Elements included, will handle more smoothly than mpeg-2. For this you'll need a converter application. Try Virtualdub (www.virtualdub.org) with fccHandler's mpeg-2 upgrade (http://fcchandler.home.comcast.net/stable/index.html) or Pegasys' TMPGenc DVD Author 1.6 (www.pegasys-inc.com/en/download/tda16.html).

SPREADSHEETS

Formula won

Q Is there a formula in Excel using functions such as left(), right(), mid() that looks for a particular character or space in a cell and will only extract everything up to, or beyond, that character or space?
Patrick Russell

A Certainly. Here's an example. If you have a list of surnames and first names in single cells down column A, starting in cell A2, you can separate them into different columns. You can put the first names into column B with the formula =MID(A2,(FIND(" ",A2,1)-1)+2,LEN(A2)) in cell B2 and the surnames into column C with the formula =LEFT(A2,(FIND(",",A2,1)-1)) in cell C2. Drag these formulas down columns B and C. Look up the functions MID, FIND, LEN and LEFT in the Help files to understand what is happening.



You can separate the contents of text cells easily with a simple formula

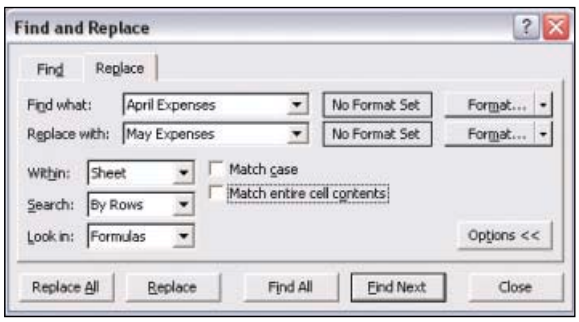
SPREADSHEETS

Excel, with a bit of previous

Q I have a workbook in Excel 2003 for managing my finances. I have one sheet for each month and some formulas to reference figures from the last month's sheet. Is there a way to tell Excel to reference a cell in the previous sheet in the workbook?
Jake Dovey

A Excel doesn't allow you to refer to the current sheet minus one or plus one. But you can change all such references in one go.

Suppose you have a number of cells containing references such as ='April Expenses'!F17 and ='April Expenses'!AA15. You can select them all and change them to references such as ='May Expenses'!F17 and ='May Expenses'!AA15. Just Press Ctrl & H to bring up the Find and Replace dialogue box. In the Find what: box enter, April Expenses. In the Replace with: box enter, May Expenses. Don't check the Match entire cell contents box and Excel will just change the worksheet reference and retain the cell reference in each instance. Click the Replace All button and the job's done.



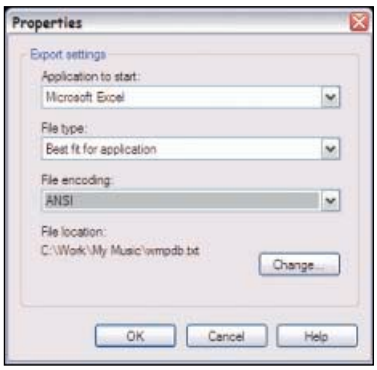
How to change all the references to a previous worksheet

DIGITAL IMAGING

Playlist it again, Sam

Q In Media Player, is it possible to export a playlist of video clips to another computer? Furthermore, is it possible to transfer the playlist to a text file so it can be edited easily?
Judah Arotsky

A In Windows Media Player 10, double-click the playlist to add it to the Now Playing List and select Save Playlist As from the Now Playing list menu. In older versions select Export Playlist from the File menu. You need to ensure that the media files can be accessed (on a networked drive, for example) from the new computer. You can open and edit .wpl files in a text editor, but this is likely to be of limited use. If you want to export and edit playlists you might find Microsoft's media info exporter plug-in more useful, and you can download it from www.microsoft.com/windowsxp/downloads/powertoys/wm_winterfun.mspx. Find the link at the top right of the page pointing to the Winterplayerpack.msi file. Download and install this file. In Media Player choose Tools, Plug-ins, Media Info Exporter to run the plug-in (see screen above) and choose the collection from the dropdown list. Clicking Properties will allow you to choose the type of file you want to export the media information to.



Use the free Media Exporter plug-in to export your playlists

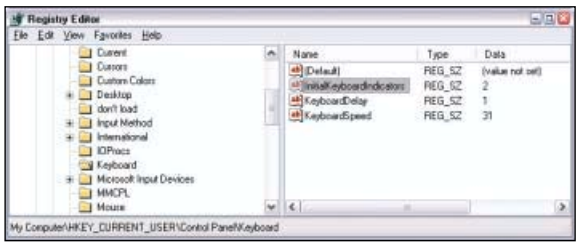
WINDOWS

Unlock NumLock

Q How do I make Windows Home Edition start with NumLock switched off?
George Parkin

A This should be the default behaviour for Windows XP, irrespective of the settings in the Bios (though it would be as well to check there too). However, this can be overridden by a Registry setting, which sounds like what is happening in your case. Run Regedit and go to HKEY_CURRENT_USER\Control Panel\Keyboard. In the right-hand pane look for a string value named InitialKeyboardIndicators. If this is set to a value of 2, then this will turn on NumLock when Windows starts. Just double-click and change its value to 0 to prevent this.

This value controls NumLock boot status



SPREADSHEETS

In all but name

Q Is it possible to prevent someone who opens any of my Excel files from saving them with another name?
Chris Hart

A You could include a macro in your file which does this. Click on a worksheet in your file. Press Alt & F11 to open the VBA editor. In the Project Explorer panel click on ThisWorkbook. In the right-hand panel enter the following:

```
Private Sub ↙
Workbook_BeforeSave(ByVal ↙
SaveAsUI As Boolean, Cancel ↙
As Boolean)
If SaveAsUI = True Then ↙
Cancel = True
End Sub
```

When you return to the worksheet you'll find that the option to SaveAs is still listed in the File menu but its dialogue box won't open. This is only a partial solution, though. If someone has a copy of any of your Excel files on disk they can easily rename them with Windows Explorer or from a Dos command prompt.

WINDOWS

Eye-spy an icon

Q I run Windows XP Home Edition. When other apps are open I can click on an icon on the Toolbar to show the Desktop. I must have fiddled with something because now it opens the Desktop Folder rather than showing the Desktop. Any idea how to change it back?
Ron Hughes

A Open Notepad (or any other plain text editor) and type in:

```
[Shell]
Command=2
IconFile=explorer.exe,3
[Taskbar]
Command=ToggleDesktop
```

Save this file as Show Desktop.scf in the Quick Launch folder.

SPREADSHEETS

Day tripper

Q How can I make Excel show the day as well as the date; for example, Sunday, 25 December, 2005?
Ralph Barnes

A In the chosen cell enter 25/12/05. On the Format menu choose Cells, the Number tab, Custom and in the Type box enter dddd, mmmm d, yyyy.

WORD PROCESSING

Last rights

Q I seem to remember you published a quick macro for opening the last Word document you were working on. Could you refresh my memory?
Tom Nielsen

A You have a long memory, Tom: it was in the February 2000 issue. Create a macro named, say, Lastdoc, with this code:

```
Sub Lastdoc()
RecentFiles(1).Open
End Sub
```

In this month's Windows column, you'll find a way to run this from a Windows shortcut. ↘

HARDWARE

Colour my world

Q I recently changed my graphics card to a Radeon 9200SE Atlantis in order to get decent TV output, but the picture on the TV screen is in black and white, even though the PC monitor shows colour.
Don Chapman

A Black and white TV output from a PC graphics card is normally down to one of two things: first, the TV video standard (in the graphics control panel) has been set to NTSC (the US standard) as oppose to Pal-I (the UK standard). This would produce a black and white picture on a UK set which doesn't support NTSC.

Alternatively, a similar result can occur when you connect a composite video output from a card to an S-video input on the TV, or vice versa. Since most graphics cards have a single plug which supplies both, perhaps there is either a problem with the cable adapter or a setting in the driver software which may allow you to select between composite and S-video.

HARDWARE

On the run

Q In April's Overclocking column you described how ATI Tool can be used to push the performance of ATI graphics cards. I wonder if ATI Tool needs to be kept running after it has gone through its diagnostics process, or whether it can be shut down afterwards while still applying the new settings?
Colin Dean

A According to the ATI Tool documentation, it must be left running to change profiles. It's therefore most convenient to load the tool at start-up by ticking the required option in the Miscellaneous section of the settings window. ATI Tool can be downloaded from www.techpowerup.com/atitool but, remember, any overclocking is carried at out your own risk.

HARDWARE

To the power of...

Q I'm building a new PC and would ideally like to re-use the case and power supply of an older system. I'd like to use a Serial ATA hard disk and will buy a motherboard with the right connector. I believe Serial ATA disks use a different power connector, though. Do I need a new power supply?
Len Marchant

A You're absolutely right. Serial ATA drives do require a special power plug. Modern power supplies should have at least two suitable cables for Serial ATA drives, but older power supplies won't have any. Luckily, you can buy adapters which let you power Serial ATA drives from older four-pin plugs. You should be able to get one from any specialist PC supplier: ITX Warehouse at www.itx-warehouse.co.uk has them for £3.23.

If your existing power supply is very old or sub-300w, though, we'd recommend upgrading to a new model as modern motherboards require a second power connector to feed hungry processors, which isn't offered on older power supplies. You may also need a higher rating to support modern hungry graphics cards. This, coupled with native support for Serial ATA and the possibility of opting for a quiet-running model, leads us to recommend an upgrade rather than an adapter.

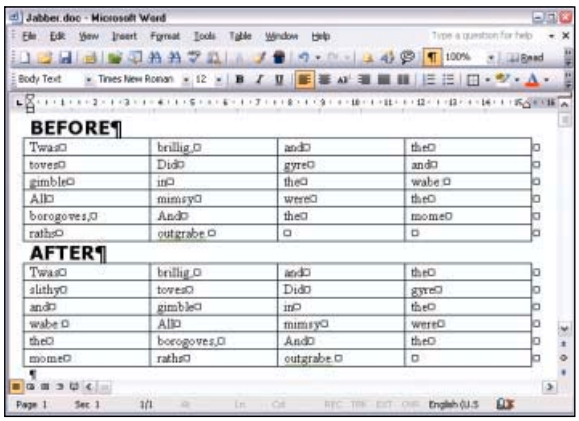
Modern power supplies often have two suitable cables for Serial ATA drives

WORD PROCESSING

Move it along

Q Is it possible to insert a cell into a Word table and have the following cells moved along so that the last cell in the current row becomes the first cell in the next row, and so on? As you may gather, the column or row of each item is not relevant, but the overall order is. I've tried all the Table – Insert – Cells... variants, but these either leave blank cells or tack on an odd cell to the side of the table.
Veronica Waldorf

A After considerable headbanging we have to agree that there seems to be no way of doing this in a table. It could be done with a macro that copied the contents of the following cells to a series of variables, then pasted each item back in the new position, but that would be something of a challenge. We have, however, found a quick and simple workaround. With the insertion point anywhere in the table, go to Table, Convert, Table to Text. Choose Paragraph Marks as the separator. This will give you a single-column list with a paragraph mark at the end of each line – turning on paragraph marks from Tools, Options, View helps here. Add (or remove) whatever items you want, making sure each has a paragraph mark after. Now select the entire list and go to Table, Convert, Text to Table. In the dialogue box specify the number of columns you want and, once again, choose paragraph marks as the separator. And that will do what you want.

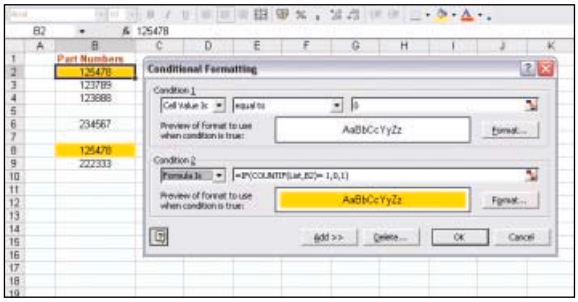


When you can't get the desired result within a Word table, a handy workaround can help

SPREADSHEETS

Code breakers

Q I have a table with a column containing code numbers which are supposed to be unique. I have been trying to write an Excel formula in a new column which results in literals 'Unique' or 'Dupe'. I have named the column I am checking 'Codes' and have tried formulas around =COUNTIF(Codes,"=Codes'"), but this does not work. What is the correct way to approach this?
Mayo Marriott



Conditional formatting can help highlight duplicate entries

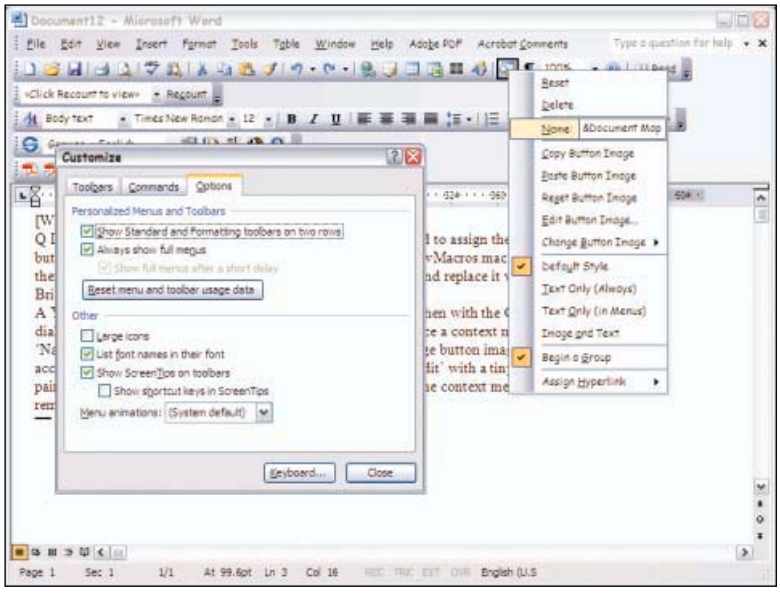
A I would suggest you take advantage of Excel's Conditional Formatting feature. Let's say that in the range B2:B9 you have a number of entries containing part number codes. This solution also copes with the possibility of there being some blank cells. First name this range List. Highlight the range, choose Conditional Formatting on the Format menu. Make Condition 1, Cell Value Is, and then equal to, and in the third box put 0. For the font format choose white from the Patterns colour palette if your background colour is white. Make Condition 2, Formula Is, =IF(COUNTIF(List,B2)= 1,0,1) and choose gold from the Patterns palette. Although zero in a cell, from Excel's point of view, is different from a blank cell, this works. There are other solutions to your problem, but this one might appeal to you.

WORD PROCESSING

Word weary

Q I have recorded and edited some macros in Word, and I have managed to assign them to toolbar buttons, but I can't get rid of the text, which reads 'Normal.NewMacros. macroname'. Is there any way I can shorten this text or simply get rid of it altogether and replace it with an icon?
Brian Wilkin

A Yes. Go to Tools, Customise and then, with the Customise dialogue open, right-click on the toolbar button. This will produce a context menu with a Name field you can edit. You'll also find 'Change button image' giving you access to ready-made images you can edit with a built-in painting program. Choose Default Style from the context menu to delete text.



Renaming toolbar icons is fairly straightforward

DATABASES

A horror SQL

Q I have used Access at work for several years and am very familiar with SQL as a language. I've asked for the ability to send SQL queries to the database (which is Oracle), but the IT department refuses to allow this. I reckon I'm competent and IT is simply being difficult. IT reckons I'm incompetent and that they are being reasonable. What is common practice in these situations?
Alan Davies

A It is common practice NOT to allow users of a database to type SQL directly against a production database. The reason is because it is horribly easy to type something such as:

```
DELETE FROM ACCOUNTS;
```

This would result in serious grief for the IT department that gave you the power to do it. Even if IT restricted you to read-only access, you could still glue the system down with queries such as:

```
SELECT Customers.*, Orders.*
FROM Customers, Orders;
```

This is a Cartesian join and will return the product of the two tables. If the first is one million rows and the second is 10 million, the answer table will be 10,000,000,000,000 rows long. Running such a query will not endear you to the other users.

I do sympathise, but I also understand that the IT department's main job is to ensure the continued operation of the database. And, yes, you can quote me on this one.

LET US HELP YOU

All our experts welcome your queries. Please respond to the appropriate address below

Databases database@pcw.co.uk
Digital imaging & video digitalimaging@pcw.co.uk
Hardware hardware@pcw.co.uk
Linux linux@pcw.co.uk
Networks networks@pcw.co.uk
Performance performance@pcw.co.uk
Sound sound@pcw.co.uk
Spreadsheets spreadsheets@pcw.co.uk
Visual programming visual@pcw.co.uk
Web development webdev@pcw.co.uk
Windows win@pcw.co.uk
Word processing wp@pcw.co.uk

Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Hardware column.
Email hardware@pcw.co.uk
Please do not send unsolicited file attachments.

Character building

Monitor system or media information by adding a graphical character-based display

Character-based displays can be useful additions for any PC. They can be configured to display anything from system information and temperatures, to scrolling news reports and, of course, details of what media file you're currently playing. They're easy to fit too, using either bezels, which slot into spare drive bays, or a bare chassis for mounting behind specially designed windows on media cases.

Depending on the model, the display connects to a serial, parallel or USB port and may be powered either by the main power supply, or possibly even via the USB interface. Despite being designed for internal mounting, most employ external port connectors, which must be fed out of the rear of the case in order to be connected. An alternative and neater solution involves adapting the plug so it fits an internal header on the motherboard.

The two most common character technologies are Vacuum Fluorescent Displays (VFDs) and Liquid Crystal Displays (LCDs). As their name suggests, VFDs employ tiny fluorescent lights to generate characters, which glow on a dark background; they're most commonly seen on consumer electronics appliances such as DVD players. In contrast, LCDs generate black characters, which are viewed against a coloured backlit background. They're less common than VFDs on consumer devices, but cheaper to buy.

A third technology now available for PC displays is Polymer Light Emitting Diode (PLED), which delivers glowing characters on a dark background similar to a VFD, but with lower power consumption and wide viewing angles.

In this month's Hardware column, I'll test two of the latest character displays, and compare their features, ease of installation and compatibility with various programs, including Windows XP Media Center Edition 2005. One employs traditional VFD technology, while the second showcases PLED.

The Imon VFD with its plastic drive bay bezel removed. To the right of the 16 x 2 character VFD is an infra-red sensor for the remote control

Imon VFD

Soundgraph is fast becoming one of the biggest suppliers of character displays, thanks to deals that see its Imon products bundled with many popular media PC cases. The Imon range started life as an infra-red remote control package for PCs, which had the unique ability to power a PC on and off by remote control.

The latest Imon VFD model still has the infra-red sensor and comes with a controller, but now includes a two-line, 16-character VFD and a volume dial. The whole package is mounted in a plastic bezel, which fits into a spare 5.25in drive bay, or this can be removed in order to fit behind a window in a media PC case. The Imon VFD costs £80 from the Case Accessories section of Quiet PC at www.quietpc.com; Soundgraph's website is at www.soundgraph.com.

Like many earlier Imon products, this model employs three power connections in order to perform the remote on and off capability. First, the existing wire to the case's power button should be connected to the back of the display, while a second wire is used to connect the display to the power switch header on the motherboard. This allows the unit to switch the PC on and off, although, of course, it needs its own power to remain awake and ready for action. This is delivered by an adapter, which connects between the main white motherboard power plug and the power socket on the motherboard itself.

The unit communicates with the PC using a USB connection, although this is for data only; if you don't wire up the power connections as explained, the device won't work. Like many character displays, the supplied communications cable terminates with an external plug. This would normally be fed out the back of the case into one of the PC's USB ports. In a welcome move though, Soundgraph supplies the Imon VFD with a cunning adapter, which allows you to connect the cable to an internal USB header on the motherboard.

This may seem an obvious solution, but it's one that's been a long time coming. Sensibly recognising its potential for connecting other internal USB devices, whether they are alternative character displays or remote control sensors, Quiet PC has sourced a number of these adapters and sells them for £4.70 each. Great for anyone with a Windows Media Center PC who wants to fit the Microsoft USB infra-red sensor inside their case.

The Imon Pad remote control supplied with the Imon VFD package

Imon software

Soundgraph bundles all Imon products with its own media management software, which can handle your music, photos and video files. This was originally known as Multimedian, but

This adapter allows you to connect USB devices with external plugs to internal USB motherboard headers

a new version called Imedian was being beta-tested at the time of writing. Not surprisingly, both versions work well with the Imon remote control and VFD module, although many people will want to use the Imon VFD with other media management programs.

The Imon VFD software package installs two utilities, which run from the system tray: the Imon Manager configures the remote control, while the Imon VFD Control Panel configures the display. The latter offers several operating modes, which can show all manner of information, including time, date, system info, email alerts, news feeds, an audio graphic equaliser, or media details from a number of installed programs including Winamp and Windows XP Media Center Edition (MCE).

The Imon manager allows you to configure the remote control, including preset schemes or programming individual keys to emulate specific keyboard presses. Since Windows XP Media Center Edition can be entirely operated using keyboard shortcuts, it's simple for third-party remote controls such as the Imon to operate it. This works reasonably well in practice, although there are a few caveats.

First, the circular pad on the remote control should be switched from mouse to keyboard mode, allowing it to act like a four-way joypad and easily navigate MCE's menus. Second, there are several buttons on the official Microsoft MCE remote control, which aren't replicated on the Imon model. Some, like the Guide button, are simply mapped onto others – in this case the Imon controller's Bookmark key. Others, like the MCE Start button, are not programmed into the Imon's preset for MCE as standard, and pressing the large blue button in the middle of its remote brings up Soundgraph's own software.

Of course, this can all be reconfigured, but I still found it frustrating to operate MCE using the Imon remote, although you could argue that's partly because I'm already used to the dedicated Microsoft version – and in case you were wondering, the Microsoft controller sadly can't be used with the Imon infra-red sensor.

One of the big selling points of the Imon system could also prove to be a downfall for anyone using it with video-recording software such as MCE. As standard, the Imon remote control's power button physically switches off your PC completely, at which point it will be unable to wake itself up again to record a show. In contrast, the Microsoft remote control's power button places the system in standby, so it can wake itself up to record shows or download guide updates.

Ultimately, this problem and a remote that doesn't replicate all the MCE buttons means I can't personally recommend the Imon VFD for anyone using or building a Windows MCE system. I would instead advise using the dedicated Microsoft remote control and a separate display, such as the Matrix Orbital model described below.

If you're not using Windows MCE, though, the Imon VFD is a great choice, offering remote control and a display in a single convenient package, which works seamlessly with the supplied software and other selected programs.

Matrix Orbital MX630

Matrix Orbital is one of the biggest names in character displays, with a wide range of products employing VFD, LCD and PLED technologies – see www.matrixorbital.com. Unlike Soundgraph's Imon range, there's no built-in remote control, or any supplied media management software.

Many of Matrix Orbital's displays do, however, have a number of headers, which can be used for temperature measurement and/or fan control. Some also offer buttons, which can be configured to perform tasks such as application launching or CD transport controls. I've tested Matrix Orbital's VFD and LCDs in previous Hardware columns, so this month I decided to check out one of its new PLED models. I went for the MX630 model, which is sold by Kustom PCs (www.kustompcs.co.uk) for £75.99, including a bezel for a 5.25in drive bay.

The MX630 is a two-line, 20-character display, which is controlled and powered by a USB connection. Our model came with a cable terminated by an external USB plug, which would need to be fed out of the back of the case. For a totally internal solution, Matrix Orbital sells a cable designed to connect directly over a motherboard header, or you could get hold of one of the adapters mentioned earlier. Kustom PCs sells the internal cable for £7. The MX630 can control up to three fans and four temperature probes if desired.

Matrix Orbital supplies the MX630 with a full copy of LCDC, which, along with a number of plug-ins, can display a variety of information from programs including Winamp, Motherboard Monitor and Zoomplayer – see www.lcdc.cc for more information. LCDC works very well, but I wanted to see how easy it was to get the display working in Windows MCE.

MCE owners wanting to drive character-based displays should look no further than Dave Matheny's excellent Frontview utility. At the time of writing, a new website at www.mediacentermagic.com was being set up to host the latest version 3.0 of Frontview, but earlier versions were still available at www.mathenys.net/frontview.

I tried the beta of v3.0 and it worked seamlessly with the Matrix Orbital display and the Imon VFD. While Soundgraph's software can also drive the Imon VFD from Media Center, Frontview may do a better job, especially in terms of coming in and out of standby.

As for PLED technology, it didn't look quite as bright, nor were the characters as thin as a traditional VFD, but it had a pleasing quality, living up to its claims of good contrast, quick response time and a wide viewing angle. The MX630, with 20 characters across, also proved useful for displaying longer program names without scrolling – it's a great all-round display. **PCW**

The Matrix Orbital MX630 pictured without its drive bay insert

Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.
Email performance@pcw.co.uk
Please do not send unsolicited file attachments.

Life in the slow lane

Slowing down your CPU could lead to a quieter life – and it saves power too

This column – newly renamed Performance – traditionally celebrates pushing components further than they were designed to go, but in this month's edition we're going the opposite direction: not overclocking, but underclocking.

Underclocking has many useful applications and is already in wide use. Portable computers have long employed underclocking to run their processors slower than normal, thereby consuming less power and extending the battery life.

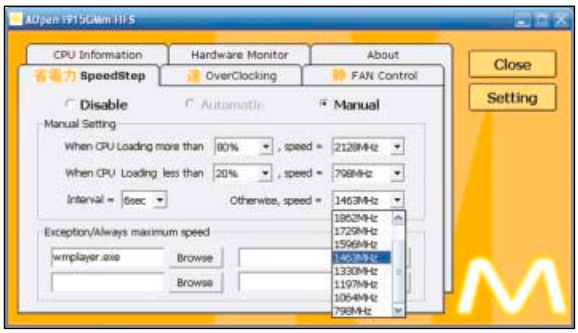
However, I suspect there are few people who'd underclock their desktop processor for this reason alone. The important potential side effect, though, is lower heat generation, which in turn means less cooling is required. Indeed, with the right degree of underclocking, you may be able to get away with minimal fan cooling, or even passive cooling alone. The result is a very quiet system.

How to underclock

Underclocking follows exactly the same theory as overclocking, but in reverse. The processor's speed is derived by multiplying the front-side bus (FSB) with the processor's clock multiplier. Since the latter is locked on most processors, the only way to change the overall speed is to adjust the FSB. With overclocking you'd increase the bus, so for underclocking you'd simply reduce it.

For example, a 3GHz Pentium 4C is designed to run on a 200MHz external FSB. It has a fixed 15-times clock multiplier, so reducing the bus to, say, 133MHz or 100MHz would underclock the processor to 2GHz or 1.5GHz respectively.

Underclocking by itself is unlikely to reduce temperatures by much, however. The key is to combine them with a lower core voltage, thereby reducing power consumption and heat generation.



Pentium M processors can be dynamically underclocked to save battery life. Utilities like the one pictured can do the same for desktop Pentium M motherboards, allowing lower heat generation

The reason you can't just reduce the voltage on a normally clocked processor is because it will become unstable. By clocking it at a lower speed, though, it could theoretically run stably on a lower voltage. It's all a case of experimentation, and once again you do so at your own risk.

Dynamic underclocking

The big problem with underclocking is, of course, reducing your processor's performance, and few people would accept this long term.

Thankfully, some processors support dynamic underclocking under either software or Bios control. This allows them to operate at full speed when required, then underclock themselves to reduce power consumption and cooling during less demanding tasks.

Processors that support this normally do so by adjusting their clock multiplier, which is unlocked downwards. This means it can be adjusted to a lower figure, but not increased. Lower clock multipliers are then automatically combined with reduced core voltage settings known to be stable at specific clock speeds.

This technique is most common in mobile processors. Intel supports dynamic underclocking and voltage reductions on its Pentium M processors and calls it Speedstep. AMD employs similar technology, called Cool'n'quiet on its desktop Athlon 64 range.

In practice

To test dynamic underclocking, I built a desktop system using the Aopen i915GMm-HFS motherboard and a 1.6GHz Pentium M processor. The Aopen board employs the mobile chipset and supports Speedstep.

A supplied utility allows you to configure Speedstep settings along with fan speeds. The manual option under the Speedstep tab (see screen), allows you to select maximum and minimum clock speeds once the CPU load is above or below certain thresholds, along with a third clock speed for any load in between.

I had already overclocked this CPU to 2.13GHz, so I set that as the speed for loads above 80 per cent. I then selected 798MHz for when the load fell below 20 per cent, and set a speed of 1,463MHz for any load in between. The system immediately responds without the need for a restart. You can also set exceptions for certain programs, which will always run at full speed.

You can then go to the Fan control tab and set the fan speed for certain temperature thresholds. I set mine to only come on above 65°C.

If running below 20 per cent load and clocked at 798MHz, the processor settled at a temperature of about 58°C, thereby not activating the fan. It would only come on briefly when the processor was under heavy load and clocked correspondingly higher.

Dynamic underclocking may have first been developed for mobile computing, but it has an equally valid role for quiet and economical desktop systems. I'll be putting the Athlon 64's Cool'n'quiet capabilities to the test in a future column. **PCW**

Great value from £17.99* a month

Does your broadband come with all this included?

✓ **unlimited** time online and unlimited downloads – no hidden charges

✓ **unlimited** digital photo storage

✓ **exclusive** sets from top artists including Jamiroquai and Coldplay

Call now to find out more about our great range of products.

Get more
0800 031 3777

AOL®
aol.co.uk/more

Conditions apply. BT line required. Some alternative broadband products also available in ntl broadband enabled areas. Subject to availability and survey. 12 month minimum contract.
*£17.99 refers to AOL Broadband Silver package, up to 512kbps.

Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Windows column.
Email windows@pcw.co.uk
Please do not send unsolicited file attachments.

Toolbar tutorial

Resurrect the shortcut toolbar with 'new document' links; and create glyphs

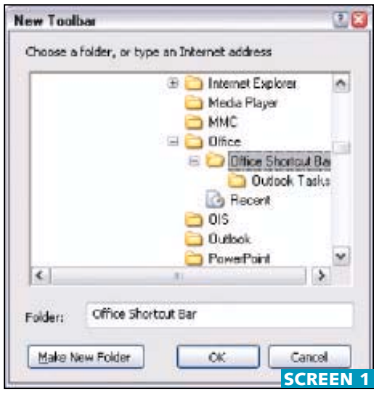
In this month's Word processing column (see page 138), we mentioned the demise of the Microsoft Office Shortcut Toolbar and promised you full details of how to create a standard Windows Toolbar with the same functionality.

This is straightforward enough in terms of providing shortcuts to the programs themselves, but requires some arcane knowledge to get 'New Office Document' or 'New Mail Message'. I'll show you some nifty shortcut and toolbar techniques, so even if you're not an Office user, you should find some useful content.

Right-click on the Windows Taskbar and choose Toolbars, New Toolbar. Navigate to where you want the toolbar stored – I went to Documents and Settings \Tim \Application Data \Microsoft \Office and clicked the Make New Folder button, giving it the name 'Office Shortcut Bar' (see screen 1). Doing it this way means that it is stored on a per-user basis along with other custom settings such as Autocorrect Entries.

This toolbar should now appear on the Taskbar, so right-click on it and choose Open Folder, and the still-empty toolbar folder will open. Next, in a separate Explorer window, navigate to the folder containing the Office program files, which on a standard installation will be C:\ Program Files\Microsoft Office \Office 11. You can now drag shortcuts to the executables – winword.exe, excel.exe, outlook.exe, and so on – into the new toolbar folder. Make sure you create shortcuts rather than move or copy the files themselves. That gives you the basics – next comes the icing.

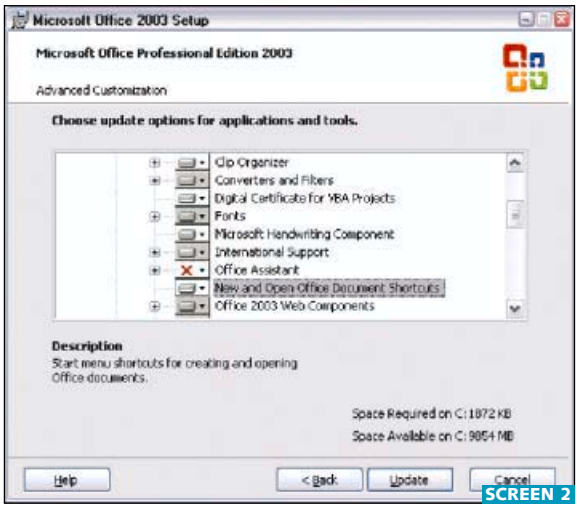
To get the New Office Document and Open Office Document shortcuts, you need to copy these from the Start Menu as they can't be created from scratch. Right-click on the Start button and Explore all users. You'll then be able to drag copies of the shortcuts into your new toolbar folder – if you drag with the right mouse button you can choose whether to copy or move the shortcuts. If you don't have these shortcuts on the Start Menu, then you need to install them. Go to Control Panel, Add/Remove Programs, MS Office and select Change. In the setup Wizard, select Add or Remove and in the next screen make sure the Advanced customisation box is ticked. In the following step expand the Office Shared Features branch, select New and Open Office Document Shortcuts and click Update (see screen 2).



SCREEN 1

Left: You can choose where to store a new toolbar

Right: Various switches enable you to add Outlook shortcuts



SCREEN 2

Installing the New and Open Office shortcuts is a bit more involved

SCREEN 3

This just leaves the various Outlook Shortcuts. For each of these you need to create a shortcut to outlook.exe with a particular switch. If you just drag additional shortcuts from outlook.exe you'll save a lot of typing and mousing, and they'll be named 'Shortcut(n) to Outlook.exe'. Right-click on each shortcut and choose Properties. In the Target box, use the switches in the right-hand column of table 1 (below) to create the shortcut listed in the left column (see screen 3).

There should be a space between the outlook.exe command and the /c switch, and if the path in the shortcut is enclosed in double quotes, the switch (and the space) should be outside these.

After you've added the switch for each shortcut, you can rename the latter from the top of the General properties tab, and change the icon on

Table 1: Shortcut switches

New appointment	/c IPM.Appointment
New contact	/c IPM.Contact
New mail	/c IPM.Note
Journal entry	/c IPM.Activity
Note	/c IPM.StickyNote
Task	/c IPM.Task

the Shortcut tab. There's a slight problem here as the outlook.exe file doesn't seem to contain the full set of icons, but if you browse to olkfstub.dll, you should find something suitable.

As this is a standard Windows Toolbar, you can continue to add shortcuts either to folders or other programs. You can also start applications with command switches. For example, if you want to open Word and load the last document you worked on, with the macro explained in Question time on page 122, then create a shortcut to winword.exe, with the switch /mlastdoc – note that in this case there is no space between the /m switch and the macro name, but that's the famed Office consistency factor for you.

Tailor the toolbar

Having got all your shortcuts in place, you can finish customising the toolbar. If you want it free-floating, drag it by its handle (the vertical bar to the left, assuming your Taskbar is horizontal) onto an empty area of the Desktop. You'll have the normal sizing controls so you can arrange the icons in a horizontal or vertical strip. You can also experiment with the options to show title, show text, have large or small icons, keep 'Always on top' and so on (see screen 4).

Which brings us to two little glitches. If you close a floating toolbar, then you can't get it back by right-clicking on the Taskbar and choosing Toolbars. All is not lost, however – just choose New Toolbar and browse to the location where you stored it. Second, if you keep the new toolbar on the Taskbar and drag it over to the right so that only the title is visible, you'll get a pop-up menu, and any sub-folders you created (but not shortcuts to other folders) will appear as sub-menus. If you float the bar on the Desktop, or have the icons showing on the Taskbar, however, you'll get these opening as a new folder.

Fonts and glyphs

As you probably know, the Unicode standard encodes characters in two bytes, rather than the single byte of the Ansi character set. This gives space for 65,536 characters, which, it's claimed, is more than enough to encode every character in every written language currently in use. A character is abstract and font-independent – for example, the number five – but a glyph is the actual rendering of that character in a particular font. The fonts supplied with

SCREEN 4

Experiment with the finished toolbar to get the results you want

Windows don't have a glyph for every allocated character – this would entail huge font files, but the versions of Times and Arial that ship with Windows XP contain 1,674 glyphs, with Microsoft Sans Serif topping this at 2,257 glyphs. If you examine the latter with the XP or 2000 Character Map (other versions only cover the first 255 characters), you'll find the Latin, Greek, Cyrillic, Hebrew and Arabic sets, plus diacritics, symbols, fractions and so on. If you look through some of the more exotically named Windows fonts, you'll find glyphs for Tamil, Devanagari, Bengali and more.

The Microsoft Font Properties Extension Tool gives you all sorts of information about a font. As well as the number of glyphs, kerned pairs, embedding restrictions and so on, you can find interesting information on the font designers. For example, the Georgia font was designed by Matthew Carter to address the challenges of on-screen display and named after a tabloid headline 'Alien heads found in Georgia' (see screen 5). You can download the free extension tool at www.microsoft.com/typography.

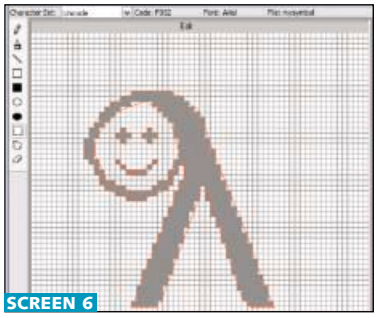
Private characters

The Character Map is tucked well away under Start, All Programs, Accessories, System Tools, but if the 1,674 Times and Arial glyphs fail to meet your needs, you can add up to 6,400 of your own using an even more well-concealed tool – the Private Character Editor. You won't find this anywhere on the Start Menu, but Start, Run, eudcedit will start it – this is in XP and 2000 only.

First, you need to select a code – we suggest F032, which is the first empty

SCREEN 5

The Font Properties Extension Tool provides lots of information about fonts



SCREEN 6

Create your very own glyphs

slot in the Private Character range for Times and Arial. Next, you need to decide whether to make this available to all fonts or just selected ones. The editor does not alter the original font files, but adds a custom TTE file to your fonts folder. If you choose to select fonts, then you'll get your first taste of the decidedly bizarre interface: it seems you can't select multiple fonts, but you can select one, save the file, then select another, and save with the same filename.

Next comes the exciting bit – designing the glyph (see screen 6). You are equipped with a grid, a range of Paint-style tools and a very small help file. If you turn on Show outline from the View menu, this will help you to get smooth curves.

Although you are working with pixels, it's the outline that is used to generate the glyphs in various sizes, just like regular Truetype or Opentype. You can also copy a character onto the grid and modify it, and have a separate reference window to display a character as a guide. You can move all or part of your creation around the grid with the selection tools. When you've finished designing a character, then you can Edit, Save character, or Save as to a different code slot. The file, it seems, saves itself as there is nothing on the File menu apart from Font links, which we explained earlier, and Exit. Once you've exited, you can try out your new glyphs. You'll find them in the Character map under All fonts (Private characters), or if you've opted for making them only available to selected fonts, under, for example, Arial (Private characters).

The Private Character Editor is to typography what Windows Paint is to fine art. For a start, if you copy a glyph onto the editing grid, the saved result will be a different size to the original and, since there is no indication of the baseline in the editing window, a lot of trial and error is involved. But at least it's free. **PCW**

Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time he prefers to travel the world – and snap it with his camera.

→ Comments welcome on the Linux/Unix column.
Email linux@pcw.co.uk
Please do not send unsolicited file attachments.

Come out of your shell

The easy way to create a script to help automate a tedious task

Last month we introduced the Unix shell. We looked at its purpose, how to run commands and pass simple arguments or options, and we looked at environment variables. This month we will take this further and look at some simple shell scripting.

A shell script is a program that runs inside the shell. It is not as versatile as a generic programming language such as C, but it provides all the basic necessities. While other programming languages are concerned with allowing you to create utilities and applications, a shell script is designed to allow you to control the way other programs or utilities are run. In its simplest form, it is a series of programs to run and, like a simple program, is executed from top to bottom. When the end of the script is reached, the shell script ends.

So here's our basic shell script. Run an editor (such as vim or kate) and create a file called test.sh containing the following:

```
echo "Hello World"
echo "This is today's date:"
date
```

Varieties of shells

THERE are several different Unix shells available. You may have seen examples elsewhere that use 'sh' rather than 'bash'. On Linux systems it makes no considerable difference as sh and bash are the same program; bash runs in a backwards-compatibility mode when run as 'sh'. Using 'bash' ensures a specific shell is run; other shells include ksh, tcsh and zsh. Each has a different style for scripting and we are concentrating on bash only: this is the most common and widely used shell.

To run the script, just execute a shell with the filename as an argument:

```
$ bash test.sh
```

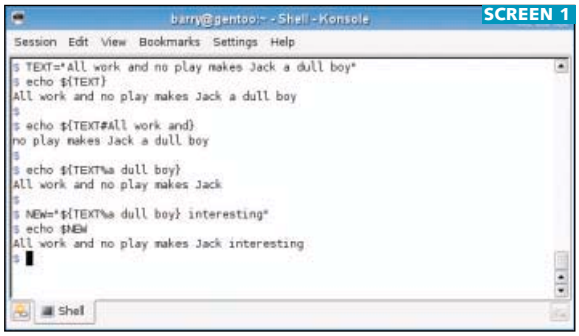
This command launches a new shell, which then goes ahead and executes the commands inside the file. If you remember from last month, the echo command simply returns whatever it's given, so in a script it acts like a print command. The date command returns the current date and time. In this instance, there is no difference between running each of these commands at the command line and executing them together in a script. In fact, there is very little real difference between shell scripts and interactive shell sessions in general; the shell constructs work interactively too, as we will see later.

Of course, shell scripts wouldn't be very useful at all if they were limited to running sequential commands alone. Before going any further, we should clean up the script above to use a more standard form. As it stands, the script is just a text file. It's not a good idea to have scripts like this, as there's no way of knowing how to run the script, which shell to use (see box left) or, indeed, if it really is a shell script.

Unix systems use a 'magic number' to identify files. The first few bytes of a file are generally enough to distinguish a certain type from another. For example, all jpeg images begin a certain way, as do pngs and mp3s. The name of the file or its extension is redundant. Shell scripts use the same principle: the start of the file should contain the characters '#!' followed by the shell, which should be used to run the script. The first couple of lines of test.sh script become:

```
#!/bin/bash
echo "Hello World"
```

Now we can mark the file as executable and run it at the command line, just like a regular utility:



Variables can be expanded in simple and complex ways in bash

```
$ chmod a+x test.sh
$ ./test.sh
```

The shell automatically launches /bin/bash to run the contents of the file. This is the form that should always be used.

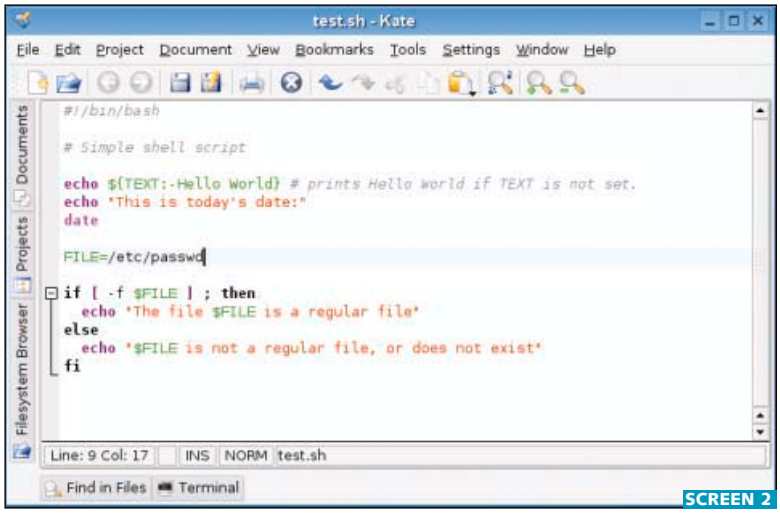
Environment variables

Last month we saw how to set environment variables and to read them back. As a reminder, to get the value of a variable its name is prefixed with a dollar sign, for example:

```
$ MYVAR=hello
$ echo $MYVAR
$ echo ${MYVAR}
```

It's customary to use upper case characters with variables to make them clear from normal programs and commands, which are usually in lower case. Environment variables are particularly useful in scripting, just as with variables in other programming languages. An environment variable only affects the shell in which it's set by default. This means that if you set a variable and then run a shell script, that variable will not be present in the script, since it is run by a new shell. In order to get around this, it is necessary to export the variable. For example, if the first line of test.sh is changed to 'echo $TEXT', you could do the following:

```
$ export TEXT="Hello World"
$ ./test.sh
```



Editing a simple shell script with kate, KDE's advanced editor

Bash supports some very advanced variable (or parameter) expansions in addition to the simple replacement shown above. For example, if $TEXT is used, but has not been set, a blank line is produced. An alternative is to use ${TEXT:-word}, which means use 'word' as a default if TEXT is not set.

Another useful feature is the pattern-based # and % characters. The hash symbol strips the pattern from the start of the line, and the per cent symbol from the end of the line. See screen 1 for an example. Here, an environment variable is set and displayed. The # symbol is first used to strip some words from the beginning of the variable, and then the % character to strip some words from the end. Finally, a new variable is set by stripping some words from the end and adding on a new word. Bash has many more advanced features like this, which, as you can imagine, add a lot of power to scripting. We'll see an example later.

Options for the <if> command

THESE are some of the most commonly used options for the <if> operator.

-a True if file exists
-f True if a regular file
-h True if a symbolic link
-r True if file is readable
-w True if file is writeable
-n True if string is non-zero length
== True if strings are equal

Additionally, numbers are compared with -eq, -ne, -lt, -le, -gt and -ge for equal, not equal, less than, less or equal, greater than, and greater or equal, respectively.

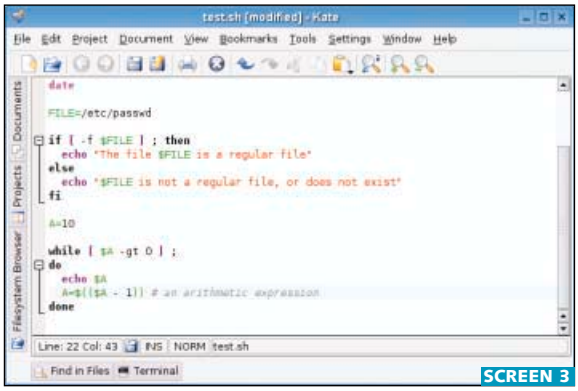
Conditions

A script is executed from top to bottom. There needs to be a way to control this flow in any kind of program, and bash features several methods. The simplest is by the use of 'if'. This can be used to make arithmetic comparisons to test strings against each other, or, more commonly, to check for variable or file properties. The general layout is as follows:

```
if [ expression is true ] ; then
code to execute
else
code to execute
fi
```

Our test.sh script now contains a basic condition. The -f option tests for whether the argument is a regular file or not. If you change FILE to /dev/null, the condition fails and the 'else' statement is executed instead, since /dev/null is device and not a regular file. You will also notice the colour coding and the expansion button around the 'if' block. The KDE kate editor is designed for programmers, and it automatically detects that you're writing a shell script and turns on helpful formatting to make writing easier (see screen 2).

There are a number of options you can test for. See the box (left) for a summary of the most commonly used ones.



The While loop allows you to repeat actions in a shell script

For and While

While loops are less common in shell scripts than in general programming, they are very useful nonetheless. A While loop lets the script check for a condition (as with 'if') and repeats that block inside, while that condition remains true (see screen 3). It has a similar structure to if, except the block to execute repeatedly is contained within 'do' and 'done' keywords.

Compare the new While loop to the if block above. This time the variable A is set to 10 and then the loop is set up. As long as A is greater than (-gt) zero, the loop is run. First, the value of A is echoed and then the value is changed. This is something new – anything contained in double parentheses and prefixed by a dollar sign, as shown in this example, becomes an arithmetic expression. The value of A has 1 deducted from it, and the result is placed back in A. As a result, the loop continues until A is equal to one and then exits.

For loops are much more useful for shell scripting. A shell script often involves a repeated action on a series of files or values, and this is where the For loop becomes particularly useful. Unlike While, For goes through a series of values (or iterates) and acts upon each one. The simplest way to explain this is with an example:

```
for i in "1 10 a b"
do
code to execute
done
```

In this example, the variable i is set to each value in the expression. So on the first execution of the loop, i is equal to 1; in the second it's equal to 10, and so on. This enables powerful use of the shell and is one of the things you will see most frequently in shell scripts. It becomes even more powerful when combined with something we've not yet seen – command substitution.

Command substitution

Shell scripts are used to execute commands and utilities, which usually output some sort of information. It's that information a lot of scripts rely on, as it lets you create scripts that depend on the results of commands instead of having a fixed and predetermined outcome. To execute a program in a script, it is run in the same way as ↘

would be at an interactive shell prompt, as with the 'date' utility in the test.sh example. The output of a command can be stored inside a variable instead of outputting it to the screen. This can be done in two ways: the traditional method is to put the command in backward apostrophes (`); the preferred modern method is to place the command inside single parentheses and prefix by a dollar sign: $(date) for example.

```
$ X=`whoami`
$ X=$(whoami)
```

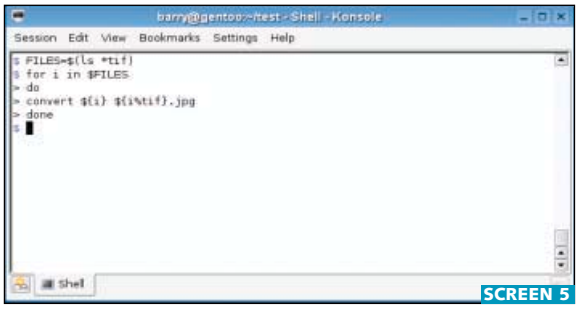
The result is identical from these two commands. The whoami program is run, which returns your login name, and the result is stored in the X variable. It would, therefore, be simple to put a condition in a script to check if a certain user is running the script.

A useful script

So far this has been mostly background theory. Let's look at writing a script that has a useful real-world purpose. Here's the scenario: we have a directory full of tiff images that have come from a digital camera. All the files end in the extension .tif. They're all very large and we want to convert them to jpeg files. It's possible that several applications exist that can do this, but we don't want to worry about that – a shell script will do the job quickly and effectively.

Some months ago we looked at the Imagemagick suite of programs (www.imagemagick.org). It's provided with all good Linux distributions and is available for OSX too. One of the tools included is the 'convert' utility, which lets you convert one graphical format into another. It can take many complex options, but at its simplest, you can do:

```
$ convert image.tif image.jpg
```



You can run loops interactively in a shell

This performs a conversion into a jpeg file using the default options. It works out the required format by looking at the extension. If there are just one or two files to convert, it's easy to do them individually. If there are a hundred files, each with long file names, it would be a painful process. Here, a script is ideal.

The heart of the script is going to involve running the convert utility repeatedly, but with different files. Since this involves iterating through a list, it seems the For loop is what's going to be required.

The list itself needs to contain each tiff file in the directory; we can use the 'ls' command for this. To create this list we need to run the 'ls' command and store the result in an environment variable. As we saw last month, we can use the '*' character to limit the files to those that end in .tif:

```
$ FILES=$(ls *.tif)
$ echo $FILES
```

Run these commands in the directory containing the images, and the echo command will show a list of all the files ending in .tif. Now we know how to generate the list, we need the For loop to step through each of them. This is simple enough:

```
for i in $FILES
```

The For loop will set the i variable to each file in turn. The body of the loop must run the convert command on each file. It may seem obvious to try the following initially:

```
convert ${i} ${i}.jpg
```

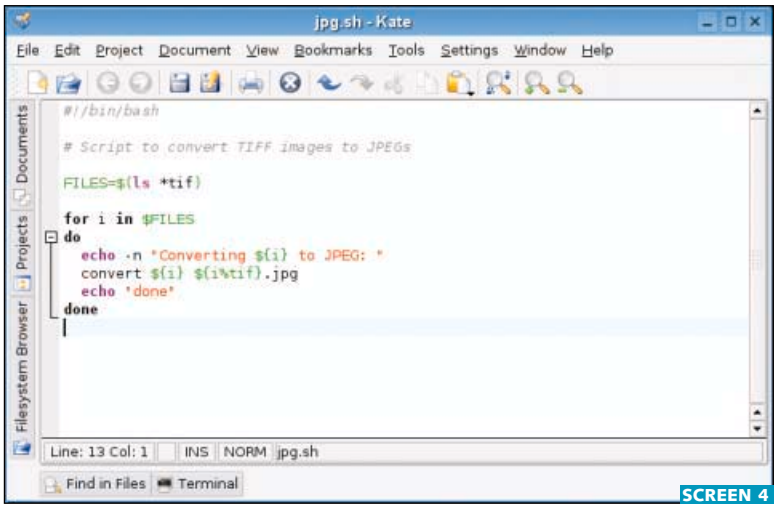
This isn't what we want, however. If the first file is called 'image1.tif', the line above would translate to 'convert image1.tif image1.tif.jpg'. The command would succeed – the conversion would take place – but the resulting file name would be confusing. Instead, we can go back to the expressions we saw earlier. The per cent symbol can be used to strip a pattern from the end of a variable. In this case, we want to strip the .tif extension:

```
${i%tif}
```

By using this notation, instead of the i variable being returned normally, 'tif' is stripped from the end if it's present. We can now rewrite the convert line to do exactly what we want:

```
convert ${i} ${i%tif}.jpg
```

Now the line translates to 'convert image1.tif image1.jpg'. The main components of the script are all complete now, and you can see the final script in screen 4. This script is not perfect; if there are no files ending in tif in the directory it fails with an error, and if it can't create the files for any reason, it will also give an error. It does, however, perform its purpose. The first echo command takes a '-n' option. This prevents it from moving to a new line, so the second echo prints 'done' on the same line as the first.



A script to convert tiff images in a directory to jpegs

The shell seekers

Scripts like these are sufficiently simple to run at the command line in an interactive shell session.

Notice that the prompt changes from the standard dollar sign to a '>' symbol (see screen 5). This means that the shell has detected a block is required, so more lines must be entered to complete the loop. Once 'done' is entered, the entire block is executed. This makes sense: it would be impossible to execute a loop before the shell knows the contents of the loop.

All this serves as an introduction to shell scripting. There are many more features, both advanced and simple, that the shell offers. As you've seen, the shell is considerably more versatile and powerful than it might initially appear.

For more information on shell scripting, check the bash man and info pages, or refer to any of the many published books on the topic. **PCW**

Morgan

WAREHOUSE SURPLUS OUTLET

MAIL ORDER SALES LINE
0870 120 4940
www.morgancomputers.co.uk

Stores in London, Birmingham and Manchester.
See below for store locations/opening hours.

HP M1150 MEDIA CENTRE PC

Includes removable 160GB USB media drive, ATi X300 graphics and TV Tuner.

- **Intel Pentium 4 515 2.93GHz chip**
- **512MB RAM, 2 x 160GB hard drives**
- **DVD±RW burner, 128MB graphics**
- **Modem/LAN, Windows XP Home**

Stock status: As new factory re-work
Warranty: 1 year HP 'pick-up & return'

£569.99 ex VAT **£669.74** inc VAT

ULTRA SLIM HP SUB-NOTEBOOK

Compaq nc4000, ultra portable design, only 28mm thin and weighs just 1.6Kg!

- **Intel Pentium M 1.5GHz processor**
- **256MB DDR RAM, 30GB hard drive**
- **12.1" TFT, SD card/PCMCIA ports**
- **Windows XP Professional Edition**

Stock status: Brand new stock
Warranty: Full 3 year HP warranty

£499.99 ex VAT **£587.49** inc VAT

MINOLTA COMPACT DIGITAL

X20 - ultra compact 2 megapixel digital camera with a 3x optical zoom lens.

- **Captures 1600 x 1200 dpi images**
- **Movie clip record, built-in flash**
- **SD card slot, weighs just 115g**

Stock status: Grade A refurb stock
Warranty: 6 month Minolta warranty

- ***Dimage X31 £69.99*** *(£82.24 inc)*

£49.99 ex VAT **£58.74** inc VAT

ADVENT MC3040 MEDIA CENTRE

Home entertainment PC, inc TV tuner with ir remote and 7-in1 card reader.

- **Intel Pentium 4 515 (2.93GHz) chip**
- **512MB RAM, 160GB hard drive**
- **DVD-R/-RW, 128MB graphics card**
- **56K/LAN/wiFi, XP Media Centre Ed**

Stock status: Factory re-work stock
Warranty: 1 year return-to-base

£299.99 ex VAT **£352.49** inc VAT

TOSHIBA EQUIUM NOTEBOOK

A60-156 with DVD SuperMulti drive - burns all popular DVD/CD formats.

- **Intel Pentium 4 532 (3.06GHz) chip**
- **256MB DDR RAM, 40GB hard drive**
- **15" TFT, up to 64MB graphics**
- **56K/LAN ports, Windows XP Home**

Stock status: Good as new classified stock
Warranty: 1 year warranty

£449.99 ex VAT **£528.74** inc VAT

MSI MEGABOOK S250

Ultra compact stylish notebook with 12.1" widescreen display.

- **Intel Celeron M 1.3GHz chip**
- **256MB RAM, 40GB hard disk**
- **CD-RW/DVD, built-in WiFi**
- **Modem/LAN, Win XP Home**

Stock status: Brand new stock
Warranty: 2 year pick-up/return

£510.63 ex VAT **£599.99** inc VAT

MSI BLUETOOTH HEADSET

- **One touch answer/voice dialling**
- **Suitable for hands-free in cars**
- **200 hour standby/5.5 hr talk-time**

Brand new with 1 year warranty

£24.99 ex VAT **£29.36** inc VAT

COMPAQ 15" TFT SCREEN

- **L1520 ultra slim 15" TFT monitor**
- **1024 x 768 dpi resolution @ 75Hz**
- **Anti-static/anti-glare display**

As new swap out stock, 6 month wty

£79.99 ex VAT **£93.99** inc VAT

MINOLTA FILM SCANNER

The Scan Elite 5400 offers quality 35mm scans up to 5400 dpi.

- **Scans 35mm negs/slides**
- **Automatic image correction**
- **16 bit colour reproduction**
- **USB 2.0/Firewire connection**

Stock status: Brand new stock
Warranty: 1 year Minolta warranty

£299.99 ex VAT **£352.49** inc VAT

PRINTER, COPIER, SCANNER

Brother 110c multifunction inkjet with 7-in-1 media card reader.

- **High res 1200 x 600 printing**
- **Flatbed scanning with OCR**
- **A4 single page photocopying**
- **Inc scanning/OCR software**

Stock status: Brand new stock
Warranty: 1 year Brother on-site

£49.99 ex VAT **£58.74** inc VAT

WIFI ADSL MODEM/ROUTER

- **Trendnet 11G WiFi modem router**
- **Share your Internet without wires**
- **Conforms to 802.11b/g standards**

Brand new with 3 year warranty

£39.99 ex VAT **£46.99** inc VAT

MSI 256MB MP3 PLAYER

- **MP3/WMA digital music player**
- **Doubles as a USB flash drive**
- **Colour LCD, compact design**

Brand new stock, 1 year warranty

£29.99 ex VAT **£35.24** inc VAT

OLYMPUS 5GB MP3 PLAYER

- **MP3 player with touch pad control**
- **Stores up to 1,200 music tracks**
- **Weighs just 100g, inc headphones**

Grade A stock, 1 yr Olympus warranty

£84.99 ex VAT **£99.86** inc VAT

FAMOUS BRAND DEAL

Brand name embargo! Boxed with keyboard, mouse and software.

- **Intel Celeron D 335 (2.2GHz)**
- **256MB RAM, 40GB hard drive**
- **DVD±RW, integrated graphics**
- **56K modem/LAN, XP Home**

Stock status: Factory refurb stock
Warranty: 1 year on-site warranty

£219.99 ex VAT **£258.49** inc VAT

LABTEC PULSE 2.1 SPEAKERS

- **3 speaker computer sound system**
- **10W RMS output, volume controls**
- **Ideal for MP3s, portable CDs etc**

Brand new stock, 1 year warranty

£9.99 ex VAT **£11.74** inc VAT

BELKIN USB DOCKSTATION

- **Multi-port USB docking station**
- **Serial, parallel, PS/2 & USB ports**
- **Powered via AC adaptor (inc)**

Brand new stock, Lifetime warranty

£9.99 ex VAT **£11.74** inc VAT

OLYMPUS C-370Z DIGITAL

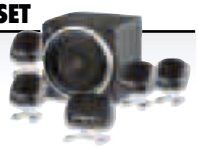
Compact 3.0 megapixel digital camera with 3x optical zoom.

- **2040 x 1536 dpi res images**
- **1.5" TFT screen, built-in flash**
- **12MB built-in RAM, xD slot**
- **C-450z £79.99 (£93.99 inc VAT)**

Stock status: Grade A stock
Warranty: 1 year Olympus warranty

£59.99 ex VAT **£70.49** inc VAT

LOGITECH 5.1 SPEAKER SET



- **Z-640 powerful 70W RMS system**
- **Ideal for movies/videogames etc**
- **Works on PC, Mac and consoles**

Brand new stock, 1 year warranty

£19.99 ex VAT **£23.49** inc VAT

TO HAVE A FREE COPY OF OUR FLYER DELIVERED TO YOUR DOOR EVERY MONTH PLEASE CALL 0870 120 4940

CENTRAL LONDON
64-72 New Oxford Street
London WC1A 1AX
Tel 020 7255 2115
Fax 020 7436 6285

GREENFORD
Unit 25 Derby Road
Metropolitan Ctr UB6 8UJ
Tel 020 8575 0055
Fax 020 8575 7985

BIRMINGHAM
34 Edgbaston Centre, Hagley Road, Birmingham B16 8SH
Tel 0121 452 1141
Fax 0121 455 6855

MANCHESTER
Unit 11-12 Station Approach
Manchester M1 2GH
Tel 0161 237 1111
Fax 0161 237 3146

BUSINESS HOURS
Monday-Friday 9.00am-5.30pm
New Oxford St late night Thurs 'til 7.30
Saturday 9.00am-5.00pm
Sunday 10.00am-4.00pm
Greenford branch closed at weekends

AMERICAN EXPRESS · Maestro · MasterCard · VISA

Stock & prices subject to change, E&OE

Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

→ Comments welcome on the Digital imaging & video column.
Email digitalimaging@pcw.co.uk
Please do not send unsolicited file attachments.

Emulating photographic filters

Using digital filters to control the colour and tonal properties of your images

As committed digital photographers, what are we to make of the Photo filters introduced in Photoshop CS? These digital filters replicate the effects produced by the coloured glass discs used in front of the lens in film photography to produce colour shifts, tonal changes and other special effects.

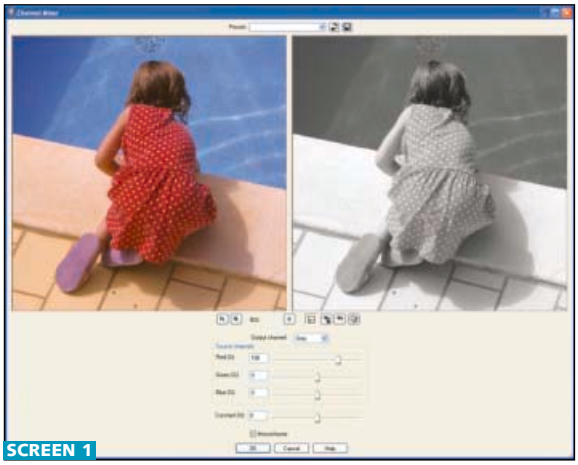
You can achieve the same effects with a greater degree of control using Photoshop's colour and tonal controls – Colour balance, Curves, Hue/Saturation – and control the extent of the effect with a selection or mask.

But it's undeniable that these filters produce good results quickly and easily. And for those used to using physical filters, they produce familiar and predictable results.

Not all applications include photo filters, but that doesn't mean you can't reproduce the effect of, say, a skylight, graduated neutral density, or soft focus filter in your image-editing application, and this month I'll show you how to do just that.

Some filter effects are easier to produce than others. Reflections in glass can be almost completely eliminated with a polarising filter, but will take a lot more work to retouch in an image editor. But reproducing the tonal shift caused by a red or yellow filter using black and white film couldn't be simpler.

A typical photographer's photo bag might contain the following filters: skylight/UV; polariser; graduated neutral density; soft focus/spot; plus a yellow, orange and red filter for use with black and white film. Another popular filter is the starburst, which spreads highlights – either light sources themselves, or specular reflections – to create a sparkle effect. In the next couple of pages, I'll show you how to create all these effects


SCREEN 1

SCREEN 2

(with the exception of the polariser) in your image-editing application. I'll be using Adobe Photoshop CS2 and Paint Shop Pro 9, with the usual caveat, that the same techniques can be used with a little adaptation in almost any image editor with layer and channel support.

Top: Paint Shop Pro's channel mixer lets you adjust colour balance

Above: Simulate any coloured filter by using the channel sliders

Black and white filters

Coloured filters used with black and white film change the relative tonal value of colours. Objects close to the filter colour are lightened and complementary colours are darkened. Typically, a yellow filter is used to darken blue skies and enhance cloud detail. Orange and red filters are used to produce very dramatic sky detail.

The best way to reproduce a coloured filter on black and white film effects is to start with a colour image. You can then use the channel mixer to select detail from the red, green and blue channels in the proportions required. If your image editor doesn't have a channel mixer, you can separate and combine the channels manually, or pick on one of the three. See the Digital imaging column in *PCW* April 2005 for a detailed explanation of how to do this in Photoshop.

Screen 1 shows Paint Shop Pro 9's channel mixer in action. To select it, choose Adjust, Color balance, Channel mixer. If it isn't already checked, click the monochrome check box near the bottom of the dialogue box. Adjust the three sliders to mix input from the red, green and blue channels. Here, all the pixel values are derived from the red channel, so the girl's dress is light and the swimming pool appears darker.

Screen 2 shows what happens if you drag the red slider to zero and bring the blue up to 100. Now the dress is darker and the water is lighter. These are extreme examples that use pixels exclusively from one channel. You can simulate any coloured filter by using the three channel sliders in the right combination – just make sure they add up to 100 to maintain the original exposure levels. You can then save the settings as presets for often used filters.

Skylight/UV

A UV (ultra-violet), haze, or skylight filter's main job is to filter out light in the UV part of the spectrum. UV is particularly apparent at high altitudes and in landscape photography where it causes a blue haziness resulting in loss of detail. As well as removing UV, Skylight (also known as 1A) filters add a slightly warm cast.

The aerial shot of a mountain range shown in screen 3 is about as bad an example of haze as you are likely to see. One of the things haze does is reduce the contrast – images lack punch because there are no blacks. Fortunately, while most image editors have no haze filter, they all offer tools for increasing contrast. In this instance, the image is massively improved by a quick levels adjustment. The 'before' histogram on the left shows the typical profile of a hazy image. Dragging the shadows input slider to the left-hand edge of the histogram is all that's required.

Another technique that works just as well is to duplicate the background layer, set the blend mode to multiply and reduce the opacity as required – between 50 to 75 per cent usually works well.

Graduated filters

Graduated filters are sheets of glass, or acetate with colour that fades from top to bottom. Typically, they're used to tint skies (see screen 4) or, in the case of neutral density (ND) filters, to reproduce cloud detail in landscapes.

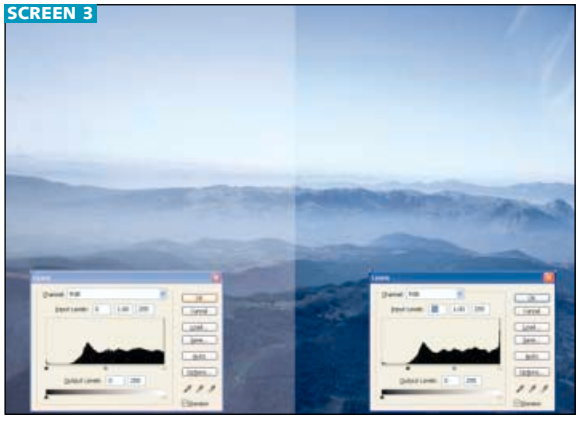
The key to reproducing graduated filter effects is to use a layer mask with a linear top-to-bottom graduated fill. This applies the effect 100 per cent at the top, reducing to zero at the bottom. Here's how to do it.

First, apply the effect using an adjustment layer. Here I've used one of Photoshop's Photo filters – the Warming filter (85) – and increased its density from the default 25 per cent to 100 per cent. Adjustment layers are automatically created with layer masks, so all you need to do to apply the effect using a gradient is to select the gradient tool (select the white to black linear gradient preset) and drag vertically down through the image starting where you want the effect to begin fading from 100 per cent and ending where you want it to reach 0 per cent.

To simulate a graduated neutral density filter, add a curves or levels adjustment layer and reduce the exposure in the sky portion of the image until you're happy with the detail. Don't worry about what happens to the rest of the image at this stage. When you're happy with the sky detail, use the gradient tool as before to fill the layer mask with a gradient and restrict the adjustment to the top section of the image.

If you want to do this properly, you should make two exposures – one for the land and another for the sky, then just put the image with the correctly exposed sky on a layer above the one correctly exposed for the land. This time, as there's no adjustment layer involved, you'll need to add the layer mask manually.

SCREEN 3



Remove haziness with a simple levels adjustment

SCREEN 4

Right: Graduated filters can be used to add a tint to skies

SCREEN 5

Blur filters let you focus attention on specific details

Soft focus/spot filter

Soft focus filters used to be popular for portraiture to soften features and produce a 'romantic' look. The image is blurred at the periphery and usually has a clear 'spot' in the centre. Nearly every image editor has a blur filter and it's easy to apply. The secret is to apply the right (small) amount and to make a feathered selection (or use a layer mask) to keep the centre sharp.

Photoshop CS2 has a Lens blur, which simulates optical blur even mimicking the way specular highlights take on the aperture shape. In the absence of such features, a plain Gaussian blur will do an excellent job.

Blur filters are a lot more versatile than their physical photographic counterparts and you can use blur to isolate and focus attention on specific details within an image (see screen 5).

Starburst

Starburst filters use a pattern of etched lines on the glass surface of the filter to create flared stars from strong highlights. They are defined by the number of points they produce. In an image editor you can produce any number, at any angle. Here's how to create a four-point starburst effect in Photoshop (see screen 6).

To select the highlights, choose the channel which best isolates them from the rest of the image and duplicate it. Select levels and drag the left input level slider to the right until all the detail, bar the highlights, disappears.

Ctrl & click the new channel in the Channels palette to make a selection from it, then switch to the Layers palette and press Ctrl & J twice to create a new layer via copy. Rename the new layers star 1 and star 2.

Select the star 1 layer and select Filter-Blur-Motion blur. How much blur you need depends on the size of the image – here I've used a value of 160 pixels at 45°. Repeat the blur on the star 2 layer using the same distance, but an angle at 90° to that used for the star 1 layer.

If the effect isn't strong enough, merge the two star layers into one and copy it. Don't worry if it looks a bit over the top, you can always tone it down using the layer opacity slider. **PCW**

SCREEN 6

Starburst filter creates flares from highlights

Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ **Comments welcome on the Word processing column.**
Email wp@pcw.co.uk
Please do not send unsolicited file attachments.

Where are they now?

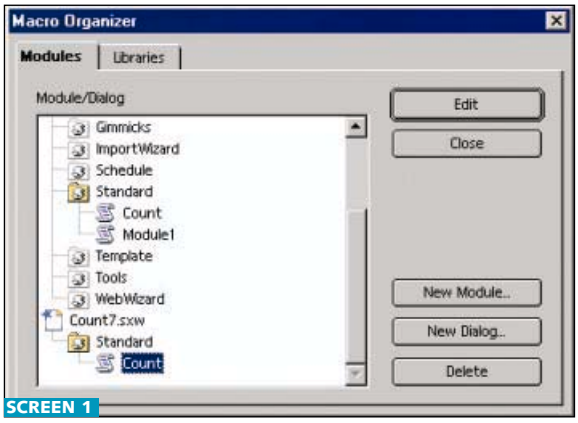
How to restore missing features, count words and rotate table text

As well as adding features to Microsoft Office, the developers take them away. In version 2003, the Office Binder and the Office Shortcut Bar disappeared. The Binder enabled you to combine different types of data – documents, spreadsheets and so on – in a single container, with an option for global page numbering. But, according to Microsoft, it was never popular, possibly because of a distinctly 'could do better' implementation.

If you have bound files from a previous version, 2003 contains an 'unbind' tool that will restore these to their separate files. If this isn't installed on your PC, you'll need to go to Control Panel, Add/Remove programs. Select Office 2003, click on Change, then select 'Add or remove features' in the Office Setup Wizard and click Next. In the next window, check the option to 'Choose advanced customisation…', then click Next. In the following dialogue expand the 'Office Tools' branch and select 'Microsoft Office Binder Support' and click on 'Update'. Depending on whether or not the setup files were cached on your hard disk on installation, you may need to insert the original CD.

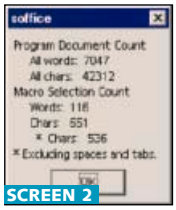
There's an application with similar – but more powerful – functionality, called One Note, which lets you combine notes, images, audio and other files in all kinds of interesting ways and then share them with a PDA or tablet. But although this is a member of the 'Office Family', it involves a separate purchase. However, you can download a trial version from www.microsoft.com/office/onenote/prodinfo/default.mspx.

Turning to the Office Toolbar, it is possible to install this from a previous version, and there's a how-to Knowledgebase article at http://support.microsoft.com (search for 830180), which rather quixotically states that: 'We do not recommend installing multiple versions of Office on the same computer. However, this method will work.' An alternative is to create a Windows Toolbar with the same functionality, and there's a blow-by-blow account of this in the Windows column on page 130.



SCREEN 1

You can copy the macro for global use



SCREEN 2

When you count a selection using the macro, a message like this will appear

Counting stars

One of the weaker word-processing features of Star Office and Open Office is the word-counting facility. In fact, you would be forgiven for thinking it didn't have one as, although the interface is similar to Microsoft's, there's nothing promising on the Tools menu. You have to go to File, Properties, and the Statistics tab. There you will find a count of pages, paragraphs, words, characters and so on. But these counts are for the entire document, and there is no built-in way to count the words in a selection.

To get round this, you need a macro. Go to the Sun support forums at http://tinyurl.com/88tj2, then click on the link to count7.sxw, which should initiate a download of this macro.

When the download is complete, open the file in Star Office or Open Office Writer – you'll get a warning that the document contains macros – then press the Run button. The text content of the document is fairly meaningless and included just for testing purposes, but it's the macro we want. So go to Tools, Macros, Macro… and click the Organiser button. In the Macro Organiser list, drag the Count macro from Count.sxw, Standard, to sOffice (or oOffice), Standard (see screen 1). This will copy the macro, giving you global access without having to open the Count.sxw document every time. At this stage you can also put the macro on a menu or give it a keyboard shortcut by selecting the macro and pressing the Assign button, although it doesn't seem possible to assign it to a toolbar. You can then close Count.sxw.

Try out the macro by opening any document, selecting some text and running the macro – you should get a message similar to that shown in screen 2.

Skew you

One reason for creating tables using an Excel worksheet rather than a Word table is the greater range of formatting options. Although you can only rotate text in a Word table cell in multiples of 90°, Excel lets you rotate text in a cell to any angle. This is useful if you have, for instance, a verbose heading row but short entries in the table body, as you can then slant the text in the headers so that the table takes up less width but the headers are still readable without craning your neck excessively.

Wordperfect users have a similar feature built in to tables. Although you can't specify any angle (it defaults to 45°), you can skew the contents of a row or column from the Format, Table dialogue. If you experiment with the various possibilities in conjunction with the cell widths and shading, you'll find you can produce some attractive 3D effects. **PCW**

Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

→ **Comments welcome on the Spreadsheets column.**
Email spreadsheets@pcw.co.uk
Please do not send unsolicited file attachments.

Take a statistical shortcut

Make use of the built-in Analysis Toolpak to investigate a set of data the easy way

Every release of Excel since version 4 has included a shortcut that instantly uses 16 different functions to analyse a table of data. Here's an example to show you how to use it.

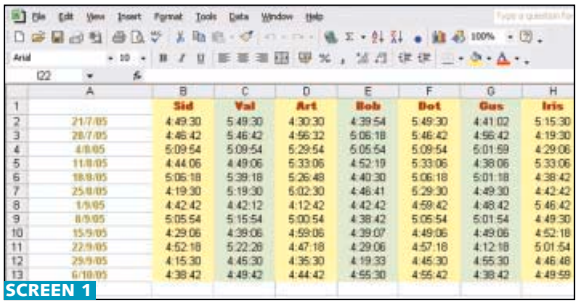
Imagine a cycle club. Every week for 12 weeks each member rides a set course and their times are recorded. It's not a competition – the riders are more interested in self-improvement. They want to analyse their results for their median time or their best and worst times, for example.

One way to calculate these results is by using formulas based on functions such as AVERAGE, MEDIAN, STDEVA, MAX, and SMALL or MIN. But a quicker way to get the answers can be found in the Analysis Toolpak. Choose Data Analysis on the Tools menu. If it's not shown then you can load it by choosing Tools, Add-ins and checking the Data Analysis entry – if it's not in the list you'll need to load it from your Excel or Office CD.

First, lay out the example as in screen 1. In the range B2:H13 are displayed the results for the 12 weekly rides of seven of the cyclists, given in hours, minutes and seconds.

From the Tools menu, choose Data Analysis and then Descriptive Statistics. In the dialogue box displayed, click the red arrow beside Input Range and highlight the range, B1 to H13. Select Grouped by: Columns. In the first row check Labels. Make the Output Range B15. Check Summary statistics, Kth Largest and Kth Smallest. Change Confidence Level for Mean from 95 per cent to 99 per cent. Click OK and then format all the applicable cells for Time.

Excel writes a two-column table of statistics for each column or row in the input range. You don't need the repetition of the statistics' descriptive names, so you can copy one set into column A and eliminate the rest. You also don't need the members' names now as they are in row 1, so you can clear row 15 (see screen 2).



	A	B	C	D	E	F	G	H
1		Sid	Val	Art	Bob	Dot	Gus	Iris
2	21/7/05	4:49:30	5:49:30	4:30:30	4:39:54	5:49:30	4:41:02	5:15:30
3	28/7/05	4:46:42	5:46:42	4:56:32	5:06:18	5:46:42	4:56:42	4:19:30
4	4/8/05	5:09:54	5:09:54	5:29:54	5:05:54	5:09:54	5:01:59	4:29:06
5	11/8/05	4:44:06	4:49:06	5:33:06	4:52:19	5:33:06	4:38:06	5:33:06
6	18/8/05	5:06:18	5:39:18	5:26:48	4:40:30	5:06:18	5:01:18	4:38:42
7	25/8/05	4:19:30	5:19:30	5:02:30	4:46:41	5:29:30	4:49:30	4:42:42
8	1/9/05	4:42:42	4:42:12	4:12:42	4:42:42	4:59:42	4:48:42	5:46:42
9	8/9/05	5:05:54	5:15:54	5:00:54	4:38:42	5:05:54	5:01:54	4:49:30
10	15/9/05	4:29:06	4:39:06	4:59:06	4:39:07	4:49:06	4:49:06	4:52:18
11	22/9/05	4:52:18	5:22:28	4:47:18	4:29:06	4:57:18	4:12:18	5:01:54
12	29/9/05	4:15:30	4:45:30	4:35:30	4:19:33	4:45:30	4:55:30	4:46:48
13	6/10/05	4:38:42	4:49:42	4:44:42	4:55:30	4:55:42	4:38:42	4:49:59

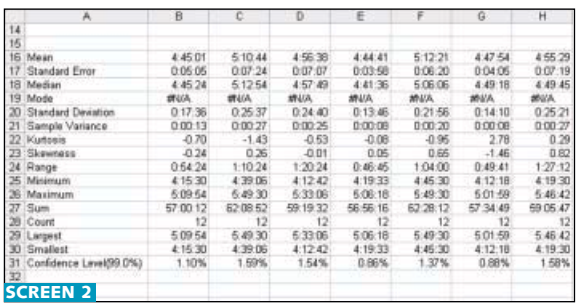
SCREEN 1

The results of a dozen rides by seven cyclists

Using Sid's results, here's what each statistic tells us. The first is Mean. Click on a blank cell, then the arrow beside the SUM tool, and choose Average. Within the displayed brackets enter B2:B13. You'll get the same result because Excel's AVERAGE function gives a mean average (the point midway between fastest and slowest times).

If you're confused between a mean average and a median point, enter in consecutive cells the numbers 1, 9, 10, 13 and 25 and apply the AVERAGE function to the range. The answer is 11.60; that's the sum of the values (58) divided by the number of the values (5). But if you use the MEDIAN function, the result is 10. A median is simply the central statistic in an odd-numbered list, or the average between the two central statistics in an even-numbered list.

The Standard Error refers to the error in calculating the mean and is the equivalent of the STEYX function.



	A	B	C	D	E	F	G	H
14								
15								
16	Mean	4:45:01	5:10:44	4:56:38	4:44:41	5:12:21	4:47:54	4:55:29
17	Standard Error	0:05:05	0:07:24	0:07:07	0:03:58	0:06:20	0:04:05	0:07:19
18	Median	4:45:24	5:12:54	4:57:49	4:41:36	5:06:06	4:49:18	4:49:45
19	Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
20	Standard Deviation	0:17:36	0:25:37	0:24:40	0:13:46	0:21:56	0:14:10	0:25:21
21	Sample Variance	0:00:13	0:00:27	0:00:25	0:00:08	0:00:20	0:00:08	0:00:27
22	Kurtosis	-0.70	-1.43	-0.53	-0.08	-0.95	2.78	0.29
23	Skewness	-0.24	0.26	-0.01	0.05	0.65	-1.46	0.82
24	Range	0:54:24	1:10:24	1:20:24	0:46:45	1:04:00	0:49:41	1:27:12
25	Minimum	4:15:30	4:39:06	4:12:42	4:19:33	4:45:30	4:12:18	4:19:30
26	Maximum	5:09:54	5:49:30	5:33:06	5:06:18	5:49:30	5:01:59	5:46:42
27	Sum	57:00:12	62:08:52	59:19:32	56:56:16	62:28:12	57:34:49	59:05:47
28	Count	12	12	12	12	12	12	12
29	Largest	5:09:54	5:49:30	5:33:06	5:06:18	5:49:30	5:01:59	5:46:42
30	Smallest	4:15:30	4:39:06	4:12:42	4:19:33	4:45:30	4:12:18	4:19:30
31	Confidence Level(99.0%)	1:10%	1:59%	1:54%	0:86%	1:37%	0:88%	1:58%
32								

SCREEN 2

Data analysis of the above statistics

The Median (and the function of the same name) gives the midway point of all Sid's results if they were arranged in numerical order.

The Mode of a range is the most frequently occurring number. The Mode function gives the same result. As it is unlikely Sid would cycle the distance in exactly the same time twice, this function will display #N/A. The Standard Deviation (and the STDEVA function) measures how widely Sid's results are dispersed from the average value (the mean). His average time for the course is four hours, 45 minutes and one second, but typically he will be around 17 minutes and 36 seconds off this time. The Sample Variance (and the VARA function) shows Sid's statistics could be 13 seconds off.

Kurtosis is a measure of whether the data is peaked or flat relative to a normal distribution. Data sets with high kurtosis tend to have a distinct peak near the mean, decline rather rapidly, and have heavy tails. Data sets with low kurtosis tend to have a flat top near the mean rather than a sharp peak. A uniform distribution would be the extreme case. This is of little interest to most cyclists so that row can be deleted. The Skewness row can also be deleted.

The Range is simply the difference between the longest and shortest times Sid has taken. The Minimum – and further down the Smallest – both give Sid's best time. The Maximum – and further down the Largest – both give Sid's worst time. You could use the MIN and MAX functions for the same results.

Providing you format the cell as [h]:mm:ss (to accumulate the hours), the Sum statistic totals all the time Sid has spent cycling. Count confirms he made the ride a dozen times. Initially we picked 99 per cent as the confidence level, and the Confidence Level statistic shows how much each cyclist's results are off. **PCW**

Nigel Whitfield edited computer magazines before going freelance in 1995. A specialist in Internet and consumer issues, he has a degree in Computing Science from Imperial College.

→ **Comments welcome on the Web development column. It returns in the January issue.** Email webdev@pcw.co.uk *Please do not send unsolicited file attachments.*

Syndication really is simple

RSS 2 offers so much more than podcasting, so why not roll out your own news feed?

In last month's Sound column, Niall Magennis looked at podcasting. What's that got to do with web development? Well, although there are services designed to make it easier to get up and running with a podcast, the underlying technology is something we've looked at before in this column (May 2004), that is RSS, or Really Simple Syndication.

The version we looked at was RSS 0.91, which was probably the most widely supported – and is also the easiest to code by hand.

Unfortunately, RSS 0.91 is fairly basic. It's fine for syndicating news from your website, as long as you don't want anything other than straightforward text. It also lacks some useful attributes, such as information about when something was published.

Podcasts typically use RSS 2, which adds support for plenty of extra attributes, including enclosures, which are what's used for podcasting. We'll look in more detail at how they're handled here.

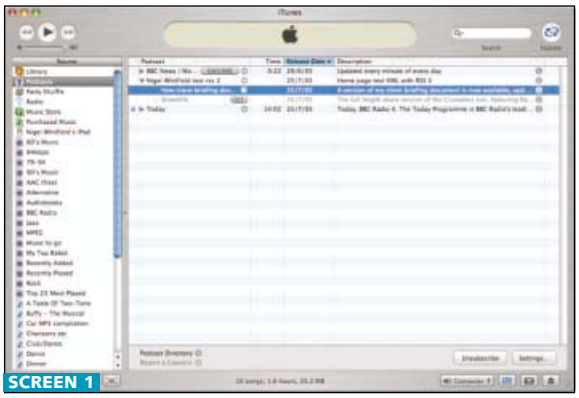
You could use enclosures, for example, to distribute software updates, or any other file that needs distributing regularly, such as a price list, updated contact information or staff rotas.

A brief recap

Let's quickly recap and look at 0.91. A simple description for a feed might look a little like figure 1.

Most of the elements are necessary, while some are optional – for example, the language doesn't have to be specified, and an item can contain just a description, if it's all that needs to be said, rather than a title and a link too.

RSS 2 adds lots more useful information to the channel and the item elements. Most of it is optional, but it can help make things more efficient.



SCREEN 1

Itunes has made it very easy to find podcasts, but you can also use the same mechanism to distribute documentation and other types of files

Updates

First, the version needs to be set to '2'. You can add optional images to your channel, just as in 0.91, and there's a Time To Live (ttl) value. That's the number of minutes that the channel information can be considered to be valid, and thus not need checking. It means that a well-behaved client won't check for an update from your server. So, if you put this:

```
<ttl>120</ttl>
```

in your feed description, then even those RSS readers that are set to update every five minutes shouldn't bother your server so often.

There are some other elements that help control time. PubDate is the publication date of your content – that might be a daily thing, for a news magazine, for example, or monthly for a periodical, and it's in the same format as dates on emails, RFC 822 (www.rfc.net). The same is true for lastBuildDate, which indicates when the content of the channel changed. This would typically be the date of the most recently changed item. An entry might look like this:

```
<lastBuildDate>Mon, 25 Jul 2005 ↙
10:17:004 GMT</lastBuildDate>
```

(Key: ↙ code string continues)

You can also suggest which days or hours can be skipped, so a reader might not bother your site outside working hours, for example. More details are available at http://blogs.law.harvard.edu/tech/rss.

In the items themselves, you can now include a pubDate entry as well. In theory, you can put a date in the future, and an RSS reader might not display the item until then – but don't bet on it; if you don't want people to see something in your RSS feed, don't put it there.

A new guid tag specifies a globally unique identifier for an item, which will allow reader software to know if something is new, or just an update to an existing item. You can also specify that it's a permalink – something that can be bookmarked if people want to go back to it later, rather than just a transient link that might disappear.

```
<guid isPermaLink= "true">↙
http://www.nigelwhitfield.com/↙
work/pcw/</guid>
```

Often, you'll find you're using the same information for the guid as for the link attribute of an item. Note that the default value for isPermaLink is

FIG 1

```
<rss version="0.91">
<channel><title>Nigel Whitfield.com</title>
<link>http://www.nigelwhitfield.com/</link>
<description>Nigel Whitfield.com is the ↙
home page for a technology ↙
journalist.</description>
<language>en-gb</language>
<item>
<title>PHP tutorial</title>
<link>http://server1.nigelwhitfield.com↙
/pcw-php/</link>
<description>A tutorial in the PHP ↙
language, from basic principles to coding ↙
web pages with MySQL and handling ↙
sessions</description>
</item>
</channel>
</rss>
```

(Key: ↙ code string continues)

FIG 2

```
<item>
<title>New client briefing document ↙
available</title>
<description>A version of my client ↙
briefing document is now available, ↙
updated to provide details of work that ↙
I've been doing lately.</description>
<guid isPermaLink=↙
"true">http://www.nigelwhitfield.com/↙
clientbrief2005.pdf</guid>
<pubDate>Mon, 25 Jul 2005 12:00:00 ↙
GMT</pubDate>
<enclosure url=↙
"http://www.nigelwhitfield.com/↙
clientbrief2005.pdf" length="2705366" ↙
type= "application/pdf" />
</item>
```

(Key: ↙ code string continues)

true anyway – set it to false, the URL won't be valid forever.

Another handy thing you can do with RSS 2 is encode HTML entities, so if you want bold or italic in an item's description, you can do it using the '&' encoding. So:

```
<description>&lt;b&gt;↙
UPDATED&lt;/b&gt; I've added ↙
extra information to this ↙
article…</description>
```

would put the word 'UPDATED' in bold at the start of the description.

Enclosures

Podcasts are simply one type of an enclosure. You can add these to an RSS feed using the enclosure element. This has three attributes, url, length and type. The first is self-explanatory and the length is the size of the file in bytes. The final type is the Mime. A Mime type is a category, followed by a / and then a classification within that category. For example, an mp3 podcast will have a type of audio/mpeg, an rtf file will be application/rtf, and a web page is text/html. So, if we had a pdf that we wanted to add as an enclosure to an RSS feed, we might end up with an item description that looks something like figure 2.

The enclosure element is complete in itself. There's no corresponding </enclosure>, and you mustn't forget the single / before the closing angle bracket.

Fetching enclosures

The most popular use of enclosures is for podcasts, and there's plenty of good software that will help you with that, such as Lemon Ipodder and Itunes.

While those are good solutions, if you want to distribute audio files using RSS enclosures, they're less useful if you want to use the mechanism for other purposes.

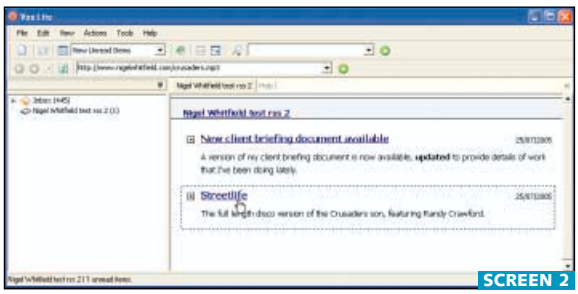
Lemon Ipodder will download a pdf, for example, but then it tries to play it in Windows Media Player, which doesn't work. I was pleasantly surprised with Itunes, however, which shows a small book icon when the pdf file has been downloaded, and opens it correctly. So if you have users who already use Itunes for podcasts, they could also use it to collect documentation from your website, for example.

Windows users might also like to consider looking at Voxlite (www.stevenwood.org), while for Mac users the full version of the Excellent Netnewswire (www.ranchero.com) offers the option to download a file, or to download it directly into the Itunes library if it's an appropriate type.

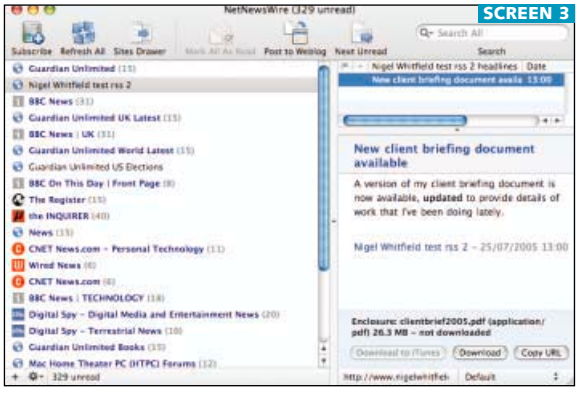
While using enclosures makes things work better for people who have up-to-date podcast/enclosure-enabled RSS readers, you can still use the mechanism to make information available to everyone, even if they don't have the most up-to-date software on their computer. In the example code above, we used the guid with a permalink, which was the same as the download URL of the file. We could have added a link element too, with the same address. By adding at least one of those you can ensure that even if someone is using an RSS reader, such as Safari's built-in RSS, or Opera, that doesn't support enclosures, there will still be something they can click on to download the content to their computer.

Below: Windows users can use Voxlite to fetch attachments via RSS

Bottom: Netnewswire supports enclosures for Mac users



SCREEN 2



SCREEN 3

Roll your own news service

Now you know how to create the feed, it's fairly simple to add a script to your website to display news and information. I've got a website for users of a Personal Video Recorder, with a small news section. It's fairly straightforward to create a page of news and an RSS feed from the same information.

In our case, we want to be able to include links and other information in the news stories, by entering HTML in the content management system. While that's fine for displaying information on the web page, it won't work in the RSS feed. Thankfully, PHP has a handy function for dealing with this sort of thing.

Where the description of a news item is stored in the field message, we can display it in our news page using:

```
<?php echo $row_news↙
['message']; ?>
```

All we have to do to make it comply with the RSS specification is use this instead:

```
<?php echo html↙
entities($row_news↙
['message']); ?>
```

It's also important to remember to test a feed script, via a site such as Feed Validator (http://feedvalidator.org/). Some RSS readers are a lot more forgiving than others. Knocking up a simple script that starts outputting an RSS feed works fine with Safari and Opera, leading to a 'job done' moment and a trip to the pub. Unfortunately, not every program is as forgiving as those. Netnewswire refused to recognise the first attempt at a feed, but helpfully includes a direct link to Feed Validator, which complained about the content type text/html.

The solution to that is a quick fix, which I should have remembered at the start of the script:

```
header('Content-Type: ↙
application/xml') ;
```

It's vital that this PHP command comes before anything else in your script that might generate output, otherwise the web server will tell programs, including RSS readers, that it's sending HTML, causing some of them to fail to recognise the feed. **PCW**

Available at WHSmith

and all good newsagents.

Or order by calling: 0870 830 4973 (please quote code Z253).

Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.
Email networks@pcw.co.uk
Please do not send unsolicited file attachments.

Securing remote access

An in-depth look at the hardware, software and practicalities of VPN technology

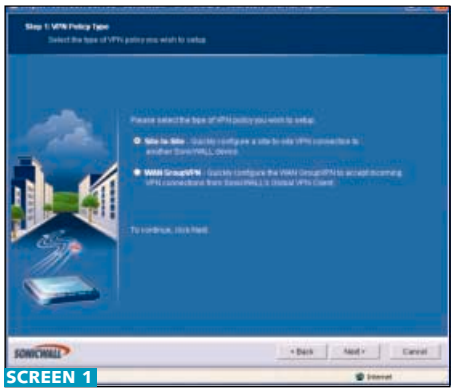
As promised, the topic for this month's Networks column is the Virtual Private Network (VPN) – the technology used to securely connect remote networks and provide remote Lan access to users over the Internet. I want to cover the various ways of implementing a traditional VPN, the hardware and software that may be required and some of the practicalities involved. But before getting down to the nitty gritty, let's recap a little on the theory.

VPNs explained

VPNs have two main uses. They can be used to link complete networks – often described as site-to-site or branch office deployment – or to connect individual teleworkers and mobile users to a company or home-office Lan. Either way, the Internet is usually used to connect everything, typically via high-bandwidth ADSL or cable services at each end, providing Lan-like performance (see screen 1).

In fact you won't get anything like Lan levels of performance, even with broadband, because most networks now run at 100Mbits/sec or more, while broadband services are limited, in the main, to 2Mbits/sec.

However, you will get a workable connection that can be used for a variety of purposes including sending and receiving email messages, viewing/editing documents and running remote applications. The data passing over the VPN connection can be as secure as on a Lan, if not more so, with all the data first encrypted then encapsulated inside standard TCP/IP packets using special 'tunnelling' protocols.



SCREEN 1

VPNs can be used to join networks together or connect remote users to a central Lan, as demonstrated on this Sonicwall VPN appliance

Down the tunnel

On the face of it, VPN technology should be easy to deploy. In practice, it can be difficult, not least because of the different ways of implementing a VPN especially when it comes to encryption and tunnelling standards.

Things aren't so bad on the encryption front, with most vendors using either DES (the Data Encryption Standard), 3DES or, latterly, AES (the Advanced Encryption Standard) algorithms. Similarly, when it comes to managing encryption keys, there's a general trend towards the use of IKE (the Internet Key Exchange protocol), which can handle simple shared keys and more advanced public key technologies. But the situation is less clear cut when it comes to tunnelling.

One of the simplest tunnelling protocols is PPTP (Point to Point Tunnelling Protocol), introduced in Windows as part of NT4. But PPTP isn't a robust technology so, with the launch of Windows 2000, it was joined by L2TP (Layer 2 Tunnelling Protocol), developed by Microsoft and Cisco.

As implemented in Windows 2000 and Windows XP, L2TP is used with yet another protocol called Ipsec (IP security protocol). Developed by the Internet Engineering Task Force, it is used to enforce authentication and security policies and, with IKE, makes for a much more secure implementation than PPTP. Most other vendors now support this combination, making it possible, for example, to connect a hardware-based VPN server to a Windows-implemented host and Windows clients.

A VPN server of some kind is always required to terminate the encrypted tunnels – either a dedicated appliance like this Sonicwall Soho TZW, or a general-purpose server running VPN server software

However, Ipsec can be used as a tunnelling protocol without the need for L2TP. That's not a problem when setting up a tunnel from one site to another using devices from one vendor, for example, but it can be where products from more than one company are involved, especially as there are lots of ways of building a VPN, using hardware, software or a combination of the two. Let's look at what's involved and how to avoid deployment issues.

Practical VPN concerns

VPN tunnels have two ends, one of which must always be terminated by a VPN host or server of some kind, be it a custom hardware device or a program running on a general-purpose PC/server. In the case of a site-to-site tunnel, the remote end will be similarly terminated on a server, while individual remote users require special VPN client software.

As there's such a wide choice of products and the encryption/tunnelling protocols they support, it's important to check the capabilities of any new VPN solution. For example, some router-based products only support site-to-site deployment. If you want to use Windows clients, ensure the host servers support either PPTP or L2TP, or you'll need custom client software which, although it avoids the compatibility issues, will cost extra to license.

Many broadband routers claim to support VPN, but that doesn't mean ↘

they can terminate a tunnel. You often get little more than the ability to pass standard tunnelling protocols through the built-in firewall; a facility referred to as VPN pass-through.

Some issues affect all servers, such as accessibility, by which I mean the ability of a remote network or individual client system to find the host server over the Internet. For simplicity, that normally means assigning a static public IP address and perhaps generating a public DNS (Domain Name Server) entry for the VPN server. But it may mean plugging the VPN server directly into the Internet, as putting it behind a firewall on a Network Address Translation-protected Lan won't work unless you're able to direct traffic to it using a DMZ (demilitarised zone) or port forwarding rules. Plus you'll need to configure the firewall to allow the various VPN protocols through – both in and out of the Lan.

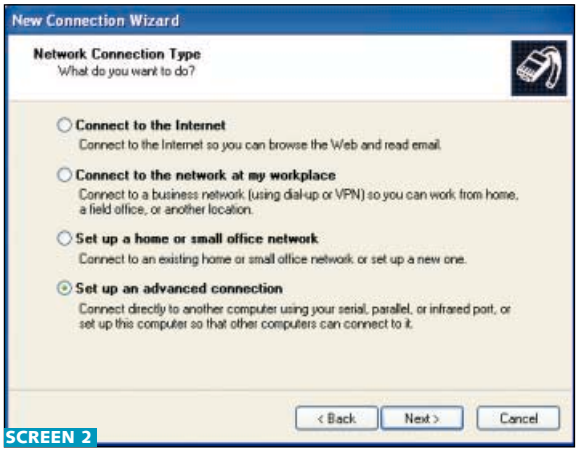
Finally, it's worth pointing out one common mistake – using the same subnet at both ends of the tunnel. Do that and the network won't be able to distinguish between traffic destined for local devices and packets that need to be routed down the encrypted VPN tunnels. The VPN connection will appear to establish correctly, but nothing of any consequence will be sent across it and it won't work.

But so much for these potential issues. Here's what you need to build a VPN and how to install it.

Hard or soft?

There are several ways of deploying a VPN server. If you're on a budget, for example, the necessary software is built into most recent implementations of Windows, and not just the server products, with a limited VPN server in XP Professional. No extra licensing is required with Windows, but you will need a PC or server to host the VPN server and the encryption demands can put a strain on the processor and memory. So if you expect a lot of traffic or a large number of users, a dedicated system will be required.

You can also get custom VPN applications, such as those from Kerio (www.kerio.com) and Smoothwall (www.smoothwall.co.uk). These cost money but the advantage is that you usually get a firewall, other security features and enhanced management tools as part of the deal. In addition, there are lots of low-cost or free open-source solutions bundled with the various Linux distributions.



SCREEN 2

Use the New Connection Wizard to configure XP Professional to host a VPN server

You still need a hardware platform for any such software solution, and an alternative approach is to employ a dedicated VPN appliance, many of which come with firewalls and other bundled security tools. Because they're dedicated to the task, performance shouldn't be an issue, but a VPN appliance can be a lot more expensive than software and may be limited in terms of the number of simultaneous tunnels that can be handled. Upgrading may be difficult (if not impossible) and, typically, appliances require licensing on a per user or per tunnel basis.

Finally, it's becoming increasingly common for VPN servers to be included in router firmware, even on relatively inexpensive broadband products aimed at the home market, such as those from Draytek (www.draytek.co.uk). These can be cost effective and, because everything comes in one box, you avoid many of the access problems associated with independent VPN hosts, especially those associated with Network Addressed Translation (Nat) firewalls, making for more straightforward deployment. Performance, however, may be limited and, as with other hardware solutions, compatibility and expansion facilities can be restricted.

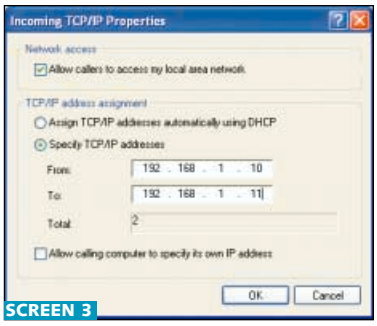
A software example

The lower initial cost means many new VPN users will opt to go down the software route. Those with Windows 2000 Server or later can configure a very capable solution quite easily, but if you're a home user, try Windows XP. You can't do this if you have XP Home, but the software required is all there in XP Professional and is easy to configure but you're limited to just one tunnel.

From the Network Connections folder, click on 'Create a new connection' and a wizard will do most of the work for you. Select 'Set up an advanced connection' (see screen 2) then 'Accept incoming connections'. Ignore the list of available connection devices, they're nothing to do with VPN, just click on Next and select 'Allow virtual private connections'.

You'll then be asked to specify users allowed to use the connection, after which you'll be presented with the Networking Software dialogue that lists the networking protocols and services to be enabled for incoming connections. The Internet Protocol (TCP/IP) settings may need to be modified here. For example, you can stop remote users accessing resources other than the VPN server by unticking the box marked 'Allow caller to access my local area network' (see screen 3). Otherwise make sure this entry is selected so other devices on the network can be reached.

You can also specify client addresses directly or use DHCP to do this (also in screen 3), remembering that the client subnet must be different from that of the VPN server. Once done, the wizard will start a background VPN server able to support PPTP L2TP/Ipsec clients. An icon marked Incoming Connections will be added to the Network Connections folder and any further changes can be made by editing this icon's properties.



SCREEN 3

You can stop remote VPN users accessing Lan resources beyond the XP server and manage their IP address assignment

The other end of the tunnel

Client software for PPTP and L2TP/Ipsec is included in Windows 2000 Professional and Windows XP, configured using the New Connection wizard. This time, select 'Connect to a private network through the Internet' and specify the DNS name or IP address of the server to create a desktop shortcut for the new connection.

Double-click the shortcut and you'll be asked to supply a suitable user name and password for the remote server, after which a series of progress messages will be displayed. Finally, assuming it all works as expected, a taskbar pop-up will appear indicating that a successful connection has been made and that your VPN tunnel is ready to use. **PCW**

Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ Comments welcome on the Databases column.
Email databases@pcw.co.uk
Please do not send unsolicited file attachments.

Access goes clubbing

Generate large reports with flexible queries and find your favourite features

In the September issue I answered a question from Nigel Williams about his club membership database. It is composed of a table called Address and another called People. In order to generate a report, Nigel specifically asked for a query that generated a single record for each address that showed all the individuals from that location (see screen 1).

If you have bought the DVD version of *PCW*, you'll find the query and all the sample files for this column on the cover disc.

As I said at the time, this solution is perfectly appropriate for a small database where the developer and user are one and the same. However, I also said that I couldn't really recommend it for a mission-critical 24/7 pan-galactic database.

Tim Lewcock (among others) has written to ask how I would have solved it for a larger system.

My only problem with the original solution is that the very structure of the query is placing restrictions on the data that can be displayed – it can't cope with families that have more than four members. If you suddenly discover that you have a family with five members, you have to redesign the query just to suit that family. Then, three months later, a family with six members joins the club and so on. What is really needed is a system that is flexible enough to cope with any number of family members.

The query above is being used to extract the data and to lay it out in a particular way; that's often a mistake. In general terms, you should use a query to extract the data you want with no thought about how the data actually looks. Once you have done that, you can then use some other tool, such as a report generator, to lay out the data.

So, you start with two tables, Address and People (see screen 2).

The primary key value in the Address table is referenced by the AddressID field in the People table to tell you where people live. First, create a query like that shown in screen 3.

The SQL for this query is:

```
SELECT Address.AddressID, ↙
Address.Address1, ↙
Address.Address2, People.FP, ↙
People.FirstName
FROM Address INNER JOIN ↙
People ON Address.AddressID = ↙
People.AddressID
ORDER BY Address.AddressID, ↙
People.FP;
```

(Key: ↙ code string continues)

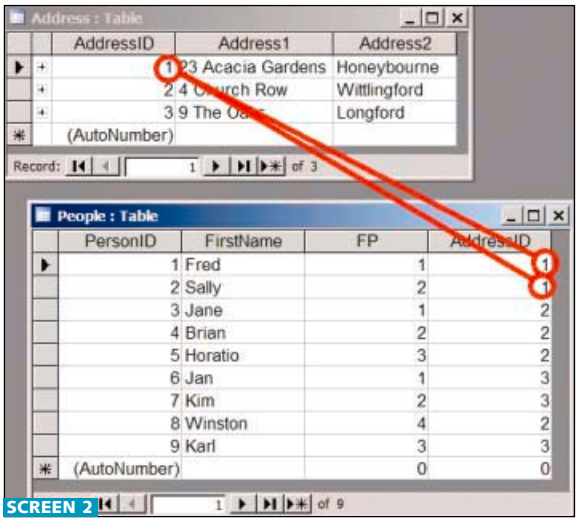
This produces an output that looks like screen 4.

It has the data you need, but there is no attempt to lay it out elegantly and much of the information is repeated multiple times. This is not a problem, as you can now base a report on this query (see screen 5).

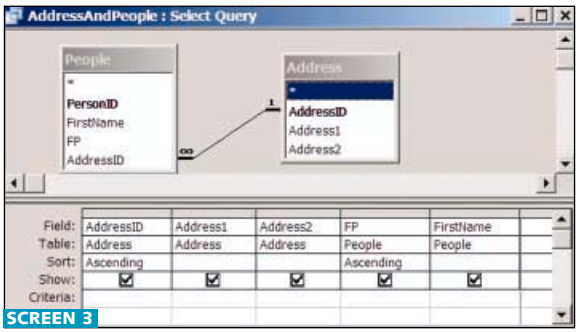
I've set the sorting options so that the addresses appear in alphabetical order and, more importantly, I've sorted on FP to ensure that the family members appear in the correct order (see screen 6).

So, you are using a query to find the data and a report to present it. This is often a better solution. The great advantage of this approach is that, no matter how many family members you have, the query doesn't have to be rewritten. In addition, because the report lists the names vertically rather than across the page, it too can cope with unexpectedly large families without running off the paper/screen.

If, for some reason, it is an absolute requirement to list the names horizontally then life becomes more complex. As far as I am aware (anyone who knows differently, send me an email) Access' report writer cannot do this by GUI alone. You may have to revert to writing some code or using a more feature-rich report writer. ↘



SCREEN 2

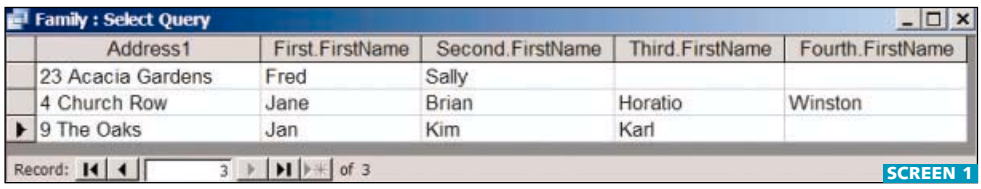


SCREEN 3

Top: The two tables with which we start

Bottom: Query to extract the data

Below: The query that Nigel wanted



SCREEN 1

Too much Access?

In the August column I explained the heavy Access bias of this column on the grounds that the majority of the emails I get relate directly to this particular database engine. I offered readers the chance to vote for the status quo, or a change, if they so desired. The results are now in: Access outnumbers the next nearest rival in the voting by a staggering five-to-one ratio. Many other database engines did receive votes (including PostgreSQL SQL Server, MySQL, Foxpro and 4D), but all in very small numbers – some as low as one vote. Interestingly, there were no votes at all for Oracle and DB2.

So, I'll keep the Access bias for now, but I will also continue to provide the SQL where appropriate, so that the majority of solutions can be transferred to other engines relatively easily.

MySQL

Yes, I know, it's another database engine and I just said that I'd focus on Access, but even if you are a confirmed Access user, there's nothing wrong with at least having a look at the other options.

One of the major advantages of MySQL is that, under certain conditions, you can download and use the software completely without charge. For example, the site www.mysql.com says: 'If you are a private individual you are free to use MySQL software for your personal applications as long as you do not distribute them.' Cleary, there is more to the licence situation than that (it runs to several pages), so please read it all and make sure your particular use is within the guidelines. If you do use it commercially, the software is still very cost-effective and very easy to download and install.

If you are used to Access, it may come as a bit of a shock to realise that MySQL doesn't have a user interface. OK, that's an exaggeration – it does have one, but it's a command-line interface. You type commands and MySQL responds.

Don't be put off though as, in many ways, MySQL is much closer to, say, SQL Server, Oracle and DB2 than it is to Access. It is essentially a server-based engine. You're not really expected to use a GUI; you are expected to write client applications that simply use MySQL as a data store.

However, if you want a GUI, there are several companies that will be delighted to sell you one. For example, Navicat (www.navicat.com) is one such, which you can find for around $100 (about £56). This gives you a GUI that lets you see, build and browse your databases. **PCW**

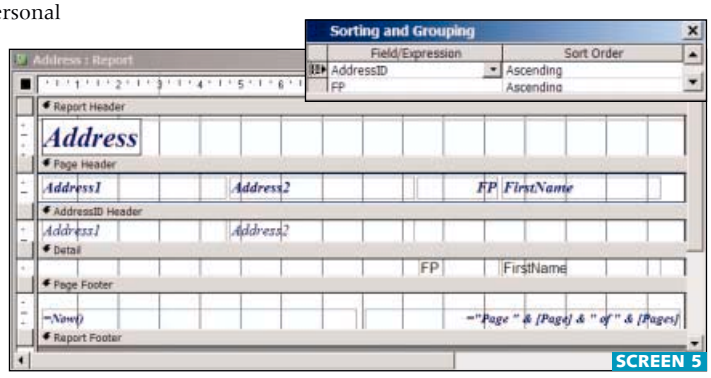
AddressAndPeople : Select Query

AddressID	Address1	Address2	FP	FirstName
1	23 Acacia Gardens	Honeybourne	1	Fred
1	23 Acacia Gardens	Honeybourne	2	Sally
2	4 Church Row	Wittlingford	1	Jane
2	4 Church Row	Wittlingford	2	Brian
2	4 Church Row	Wittlingford	3	Horatio
2	4 Church Row	Wittlingford	4	Winston
3	9 The Oaks	Longford	1	Jan
3	9 The Oaks	Longford	2	Kim
3	9 The Oaks	Longford	3	Karl
(AutoNumber)				

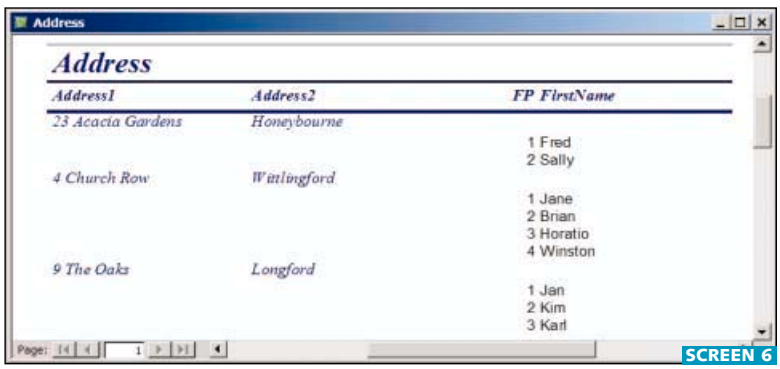
Record: 5 of 9

SCREEN 4

The data as it appears from the query



SCREEN 5



SCREEN 6

Above: The report design

Left: The report output

A PrintMe query

WHEN you move to Access from another database engine you may find it frustrating that it doesn't have your favourite feature.

Colin Whitmore emailed to say he has an Access database for club members and frequently wants to print only selected names and addresses. In his old system he could highlight one record, hold Ctrl, select several others and then simply print those as labels. However, his new system won't let him do this.

Colin's old system was designed to run in a particular way and Access works in a fundamentally different way – one side effect of this is that it doesn't offer the facility Colin wants by default. The good news is that you can get the same end result, as long as you are happy to achieve it in a slightly different way. Access tends to work very rigorously, in that it handles data in terms of sets of records. All we need to do is to give it an identifiable set of records that need to be printed and it will be happy.

One answer is to add a Yes/No field to the table called, say, PrintMe – the default setting should be 'No'. Then create a new form called 'SelectLabels'. On this form, you should be able to see the fields that you will use to identify the records to be printed (name, address, whatever) and, of course, the PrintMe field. Setting the default view of this form to Data Sheet View will probably be very useful. Then simply scroll down the list, checking the PrintMe field of each record that you want to print.

Create a query 'QueryPrintMe' that selects the fields to appear on the label and only those records where the 'PrintMe' field is selected. Create a label printing report based on that query. Finally, create an update query called 'ResetPrinting' that resets every 'PrintMe' field back to 'no'.

I realise this all sounds tedious, but once it is set up, all you have to do is open the form 'SelectLabels' and select the records for printing. Open the report and print it. Run the update query to reset the fields.

Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the Internet.

→ Comments welcome on the Visual programming column.
Email visual@pcw.co.uk
Please do not send unsolicited file attachments.

Back to basics

Rolling your own software can be fun with Microsoft's new low-cost programming tools

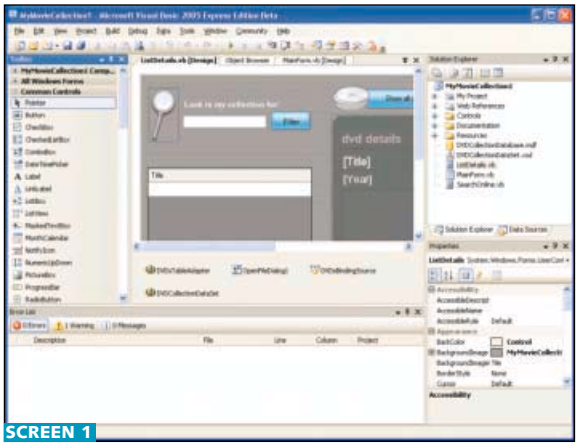
The days when magazines carried pages of type-in listings for your Spectrum or Atari computer are long gone and little missed. Even amid all the tedium of lines such as 'GOTO ZAPALIENS' there was a touch of adventure that has largely been lost. That was partly because early PCs did very little out of the box. They were inert lumps, waiting for you to come up with the magic codes that made them do something interesting.

Today's PCs are incomparably more powerful, but with mountains of software a few clicks away on the Internet there is less incentive to sit down and 'roll your own' programs.

Another problem is the complexity of today's programming tools. In particular, Visual Basic has, in some ways, gone backwards in its usability. Version 1 in 1991 was delightfully easy to use. At about the time of version 4 in 1995 it began to lose its click-and-go simplicity, and the 2002 move to Visual Basic .Net bewildered many traditional VB coders, despite its many technical advantages.

Microsoft has now produced a new suite of products that aim to put the fun back into programming as well as being genuinely useful tools. The Express series, including Visual Basic Express (see screen 1), Visual Web Developer and SQL Server 2005 Express, will be released in November and, while prices have not yet been confirmed, they will be modest. The beta versions are high quality and free, but don't install them on mission-critical machines since they make system-level updates that may be hard to remove.

To support these products, you can download sample projects, which are specifically designed for you to modify. For example, if you would like to try coding a card game, you might want to start with the Blackjack Casino project


SCREEN 1

SCREEN 2

Above: Visual Basic Express is Microsoft's attempt to make VB fun and easy again

Left: Code your own card game using this sample as the starting point

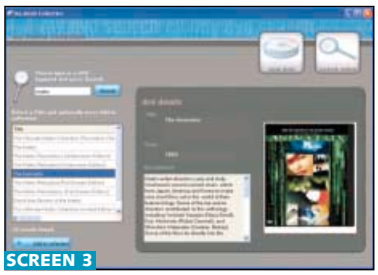
(see screen 2). This includes a set of card images and simple classes such as Card, Deck and Hand. The Deck class has Shuffle and Draw methods that do what you would expect. In practice, you would probably end up replacing most of the code with your own enhancements, as well as finding a better set of card images, but at least it gives you a working example. Another sample shows how to call on Amazon's web service API to catalogue your DVD collection (see screen 3), and could easily be adapted to handle books or CDs instead.

There is also a website called Coding4fun (http://msdn.microsoft.com/coding4fun). This is a collection of projects and other resources aimed at non-professionals. There's a section on game development, with a series on DirectX coding with the .Net Framework, and other projects showing how to integrate with Google, Amazon and even Itunes.

Under the surface, all these products, apart from SQL Server, are cut-down versions of Visual Studio 2005. Although there are plenty of additional features and tools in the full Visual Studio, the underlying IDE, compiler and .Net Framework is the same. This means that if you want to go beyond what the Express edition offers, you can always code your way round it. The alternative is to upgrade to the full version. One exception is the Compact Framework for Smartphones and other mobile devices, which is not supported at all in the Express series.

Microsoft has put a huge effort into making programming more accessible with the Express suite. Naturally, it has an ulterior motive in investing so heavily in hobbyists and non-professionals. The idea is to keep you on Windows, rather than migrating to Linux or Apple-shaped alternatives.

These are good products, but Microsoft has not quite recaptured the ease of use that was in early Visual Basic products. The complexity of the .Net Framework and the Windows API still has a tendency to spill out from time to time, which is intimidating for newcomers. As an example, the useful Object Browser displays every property


SCREEN 3

The Movie Collection shows how to call the Amazon web service to create a DVD database

and method that exists in the currently available class library, rather than a user-friendly subset. Having said that, this is an improvement on the previous Visual Studio for new programmers.

Program a webcam

I came back from this year's Tech-Ed conference with a Web Cam Pan and Tilt kit courtesy of Phidgets USA, a company which specialises in kits and components for what it calls the 'hobby robot enthusiast'.

Phidgets provides a software library, which is easy to use with Visual Basic, C/C++, Delphi or Java, along with sample code and tutorials. Admittedly, you can get off-the-shelf swivelling webcams elsewhere, but the kit is more satisfying.

The key components are a circuit board, which provides a USB interface to up to four servo motors, two servos, a standard Logitech webcam, and an assortment of brackets and bolts to stitch it together (see picture below right). Each servo is a motor, which turns a small plastic wheel, onto which you bolt a bracket or device. The main issue is mounting the servos and brackets in the correct orientation. You also need two USB connections, one for the webcam, and one for the controller board. The next step is to download and install the latest Phidgets driver software, attach the device and start coding.

Phidgets does not specifically support the .Net languages, but the Com library designed for Visual Basic 6 works fine via interop. Microsoft provides a couple of sample VB Express projects showing how to control the servos and capture the output from the webcam (see screen 4).

Controlling the servos is simple. All you need do is create a new Phidget Servo object and call its Open method. You can now set the Motor Position property to set the angle of the servo. Motor Position takes an integer argument that identifies which servo you want to control. The exact position that results from setting Motor Position to 0 varies with each servo, so you have to include an offset value and discover by trial and error what it should be. Next, you need to set maximum and minimum values. The code also uses a timer to shut down the servos after moving them.

The other point of interest is how to capture output from the webcam. You can do this with the Direct Show API, part of DirectX. Microsoft provides a managed code API for DirectX, but it excludes Direct Show. You can use Thomas Scheidegger's Direct Show.Net and Brian Low's DirectX.Capture class to embed the display from a webcam in a Windows form.

You will have noticed that the web part of 'webcam' is missing from this example. What if you wanted to have a look round your office when you are away? There are two parts to this. It would be trivial to use the Phidget Servo object in an ASP or ASP.Net application, enabling you to manipulate the webcam remotely, provided you have enabled access from the Internet to a web server running on the machine where the cam is attached, and taken account of the security implications.

The other part involves capturing frames from the cam, saving them to a file that is visible from the Internet, and having your web page refresh the image regularly. Use Javascript to update the SRC attribute of an image periodically. Admittedly, this gets you a series of stills rather than a video stream, but that is probably what you want for this kind of application.

In order to capture single-frame images, you can use Scheidegger's Direct Show.Net. The download includes an example called Sample Grabber Net which illustrates how to grab a file from a video stream.

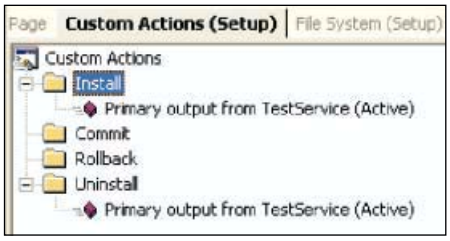
Failing that, you could use one of many utilities that can grab an image from the webcam on a periodic basis and save it to file or send it by FTP to a location of your choice. **PCW**

How to install a service

VISUAL Studio .Net 2003 includes a Windows Service project type that lets you create service applications. These run in the background and are independent from the logged-on user. Reader Matthew Allen emailed to ask how you can create a setup application in Visual Studio .Net that will install the service you have built. This is not just a matter of copying files, but also requires registering the service and specifying the account under which it will run.

You can do this using a Visual Studio setup project. The first step is to add an installer to the service. In design view, right-click the design window for your service and choose Add Installer. This creates a Project Installer class. Set the properties of the Service Process Installer and Service Installer classes that are generated. Make sure you set at least the Account property of the Service Process Installer and the Service Name and Start Type of the Service Installer. You can't set the service description here, although a Google search will find some workarounds.

The second step is to add a setup project to the solution. In the File System view, add the primary output from your service application. Then choose View-Editor-Custom Actions. Select the Install section in the designer, right-click, add Custom Action. Select the primary output as the custom action. In the properties of the custom action, set Installer Class to True.



Add custom actions to a Visual Studio setup project to have a service properly installed and uninstalled

Now add a second custom action, this time in the Uninstall section. Again set Installer Class to true. This is important, otherwise the service will not be unregistered when the application is removed.

The assembled pan-and-tilt webcam, ready for programming

Below: This VB Express application lets you control a webcam and view its output

SCREEN 4

Links

Visual Studio Express:
http://msdn.microsoft.com/express
Coding4fun:
http://msdn.microsoft.com/coding4fun
Phidgets USA:
www.phidgetsusa.com/
DirectX capture for .Net:
www.thecodeproject.com/cs/media/directxcapture.asp

→ **Comments welcome on this feature.**
Email kelvyn_taylor@vnu.co.uk
Please do not send unsolicited file attachments.

Virtually a reality

Future CPUs will make virtual PCs practical for everyone, explains Sascha Faber

A long with multi-core technology, energy-saving functions and security mechanisms, the new buzzword in processor development is 'virtualisation'.

Virtualisation refers to the idea of a single physical PC emulating several virtual PCs (also referred to as virtual machines), each of which runs its own operating system. These operating systems run simultaneously, but independently of each other, delivering a higher level of security as critical applications can each run on separate virtual machines. In addition, there is a greater choice of software as applications written for different operating systems can be used in parallel on one PC.

In the mainframe and large computer sector, virtualisation is a well-established concept. For example, multiple web servers can be operated on a single machine instead of needing to set up several identical pieces of expensive hardware.

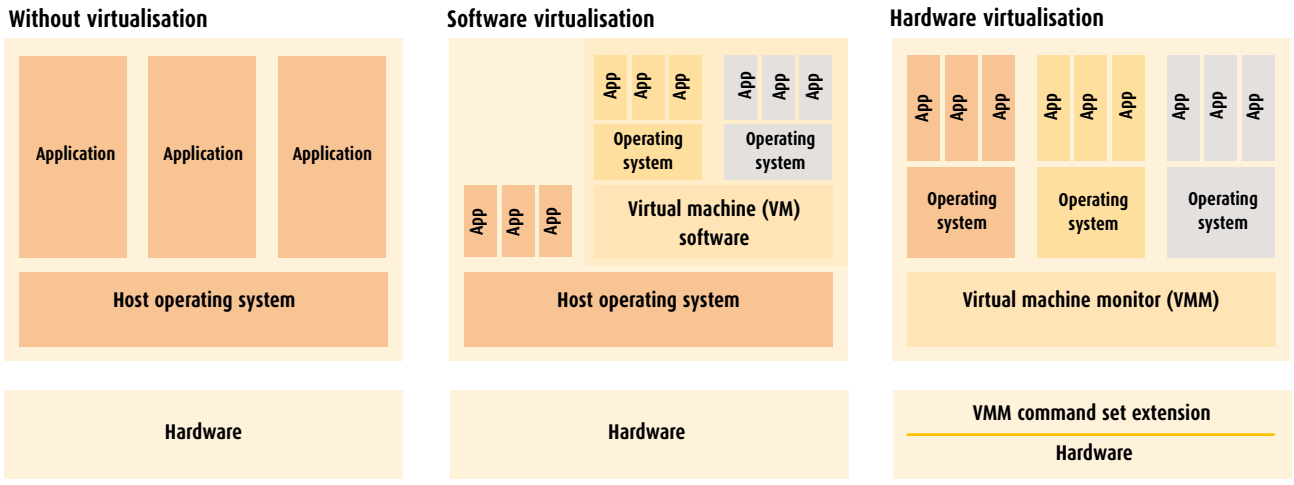
SCREEN 1

One PC can see others running different operating systems

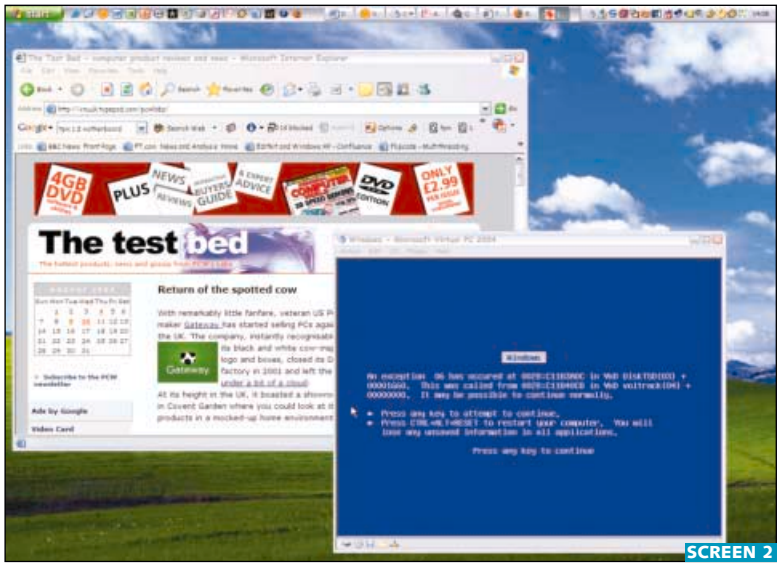
Been there, done that

Virtual PC software for desktop PCs has been around for many years. These programs work quite well, but the software overhead (see box below) means that the virtual PC's performance is often not as strong as it might otherwise be. However, this is likely to change in future, enabling virtualisation to move into the mainstream.

Virtualisation technologies compared



Using virtualisation software, multiple operating systems can run independently, but at the same time, on one PC. Only hardware virtualisation allows the operating systems to make full use of system resources



SCREEN 2

If an application crashes one system, you can carry on working on the other virtual machines

One reason for this is that both AMD and Intel are going to integrate support for virtualisation directly into their new processors' hardware. Intel hopes to deliver the first Pentium and Xeon chips incorporating virtualisation technology by the end of 2006. The processor extensions – previously codenamed Vanderpool – now go under the official title of Intel Virtualisation Technology (IVT). The relevant specifications have been available for download from Intel's website since the beginning of 2005 (see Further information at the end of this article).

AMD refers to its competing architecture – codenamed Pacifica – with the official title of Secure Virtual Machine (SVM). The specifications were published at the end of May 2005, with the first processors appearing on the roadmap for the first half of 2006. Although the descriptions are different, both AMD and Intel's virtualisation technologies work in a similar manner and are compatible with one another.

'According to some experts, in three or four years' time virtualisation technology will be a standard feature of most PCs'

The root of all things virtual

Virtualised environments have been possible for a long time on the PC: this includes software such as VMWare Workstation and GSX Server or Microsoft Virtual PC (the latter can be downloaded free as a 30-day trial).

However, you can't simply run these programs on their own. The PC running them needs a root operating system installed as a foundation; the virtualisation software then runs as an application on top of the root operating system. The application then creates further virtual machines ready for their own operating systems to be installed (see screen 1).

The virtual machines each mimic the entire hardware of a PC capable of running a full operating system and applications. Each machine has its own virtual processor, memory, hard disk, optical drives and so on. The operating system and applications work just as if they were installed on a conventional PC. To avoid conflicts, for example if two virtual PCs want to access the memory at the same time, the virtual machine (VM) software acts as a middleman between the operating systems and the hardware.

It's quite spooky to watch in operation as rebooting your virtual PC brings up the standard Bios flash screens and boot sequence.

The drawback with software virtualisation is that all demands for processing and/or hardware access, which the additional operating systems make, have to be trapped by the VM software and routed via the host operating system on the real PC. Only the host operating system is allowed to access the hardware directly. The VM software has to, in effect, act as the traffic cop between the main and virtual operating systems. This requires complicated programming tricks, which in turn makes the software unwieldy and also impacts performance and compatibility.

For example, some network or graphics cards might not be usable because device-specific hardware functions are not available. For this reason most current VM software emulates a standard set of hardware devices, which may have little in common with what is installed in the physical PC.

With the introduction of virtualisation support in the processors themselves, the VM software has to perform less intervention because the guest operating systems are allowed more direct access to the hardware (see box overleaf, Inside virtualisation). This in turn reduces the total number of commands which have to be translated by the virtualisation software by up to a quarter. Hence, performance of the virtual PCs is improved dramatically.

Firms such as Microsoft and VMWare want to make matching VM software available for the new processors. Existing VM programs will be made compatible with the new commands and hierarchy levels. VMWare already demonstrated its GSX Server with hardware support at the Intel Developer Forum in spring 2005. According to VMWare, its VM products will work with both AMD and Intel CPUs.

Another company focusing on VM software is Xensource (www.xensource.com). Based at Cambridge University, the startup has developed Xen, an open-source virtualisation infrastructure. Xen Hypervisior 3.0, with support for hardware virtualisation commands, should be available in the third quarter of 2005, complete with multiprocessor and 64bit processor support. Due to the lack of licensing agreements, Xen only works with Linux and Net BSD at the moment, but future versions could also support Windows XP.

Advantages of virtualisation

There are many good reasons for using virtualisation technology, the most important of which is security. The individual virtual machines operate separately from one another, which means that each system, depending on its use, can have a different level of security.

Games can run on a performance-optimised system without interruption

Inside virtualisation – the technical details

Operating system privileges for software running on a virtual machine can be complicated. Here's how they work

SOFTWARE applications usually run within a set of operating system privileges known as user mode (also referred to as Ring 3). The operating system itself runs in a much more privileged kernel mode (Ring 0), allowing it access to all the hardware in the PC. Applications running in user mode can only access system functions (such as accessing a processor register, for example) via the operating system. Previously, the kernel mode was the step nearest to the hardware and this meant that the VM software needed to operate in kernel mode to maximise its efficiency. Because of this, the virtual machines themselves had to be moved into a less privileged mode so they could be under the control of the VM software.

If one of the operating systems on a virtual machine wants to perform a system function such as accessing the processor register directly, this is not allowed in the less-privileged layer. This causes exceptions which have to be dealt with by the VM software – a tedious and resource-hungry process.

With hardware virtualisation, the control software, known as a virtual machine monitor (VMM), a new intermediate layer is introduced to the rights hierarchy (see diagram, right). The VMM software processors have a new execution mode which offers even more rights than the kernel mode. The VMM software runs in host or root mode, which gives it direct control of all the hardware. The virtual machines operate in guest or non-root mode, but retain full kernel mode rights, comparable with operation on a conventional PC. In guest mode the operating system has direct access to all the PC's hardware.

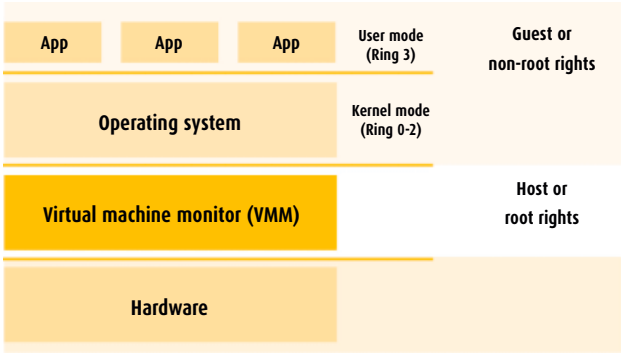
New commands

To manage the virtual machines, a range of commands, which allow the requirements of the logical systems to be processed efficiently, are available to the VMM. AMD calls these the SVM command set extensions, whereas Intel calls them virtual machine extensions, or VMX. These extensions simplify memory management, ensuring that different operating systems do not grab the same memory areas.

After issuing the VMRUN or VMLAUNCH commands, the virtual machine instructions are carried out until they are either completed, or an illegal action or a return instruction is encountered. Then the VMM software – the host system – takes control over the processor again.

Information about the actions which are allowed for the various virtual machines are stored in a 4KB block of memory, which AMD refers to as the virtual machine control block (VMCB) and Intel calls the virtual machine control structure (VMCS). Different rights for each guest system can be specified here.

In addition, this buffer stores the guest system's last processor state; for example, the contents of the CPU register. When the VMRUN or VMLAUNCH command is issued, this state is transferred to the processor. At the same time, the host system's status is also stored in its own memory block. After returning from the guest system to the host system, the virtual machine's processor state is stored in the VMCB/VMCS and the processor is restored to the state it was in when it was under the control of the host system.



In the next generation of processors, the virtualisation software (virtual machine monitor) runs in the new root or host mode via the hardware

by a virus scanner, while you can set up a separate, highly secure system for home banking or web surfing. If one of the virtual machines crashes or is attacked by a virus, the others remain unaffected (see screen 2). In addition, you can restart or repair the affected system from the host operating system without having to turn off the computer.

A further advantage is that you can use any application, regardless of which operating system it was written for. This safeguards your investment in software: if you have an application which does not work with a newer operating system, then you can simply install an older environment.

One possibility for a multimedia computer is to set up a rapid-start system for TV so that it is available almost straight after switching on; or you could have a system which is set up for near instant Internet access.

Intel wants to use virtualisation technology to make life easier for administrators. The latest motherboards with Intel 945 series chipsets use Intel's active management technology (AMT). This is supposed to allow even defective operating systems to be rescued remotely. In future, administrators will be able to log in via the AMT interface and carry out maintenance on a virtual machine without the user, working on another virtual machine, being aware of it.

A step forward

With the integration of virtualisation functions into future processors, the possibility of using multiple operating systems on one PC will become a reality. According to some experts, in three or four years' time virtualisation technology will be a standard feature of most PCs. In future, placing the code for the VM software in the motherboard Bios could be a step towards a fixed standard. This would allow the virtualisation software to take control as soon as the system is started. **PCW**

Further info

AMD secure virtual machine architecture
www.amd.com/us-en/assets/content_type/ white_papers_and_tech_docs/33047.pdf

Intel virtualisation technology
www.intel.com/cd/ids/developer/asmo-na/eng/197668.htm

SUBSCRIPTIONS OFFER

3 ISSUES FOR £1

when you subscribe to the new Personal Computer World DVD Edition

- Get your first 3 issues for just £1
- Save 37% on the shop price after that – only £3.17 an issue (shop price £4.99)
- Never miss an issue
- 4GB DVD with every issue

Personal Computer World DVD ROM

SAVE 37%

Order online:

www.subscription.co.uk/pcwdvd/v135

or call: 0870 830 4968 quoting V135

Please return this form to: Personal Computer World subscriptions, FREEPOST LON 14776, Market Harborough, LE87 4NZ (No stamp required)

☑ I want to get my first 3 issues for only £1, then pay £9.50 every three months by Direct Debit for 3 issues of Personal Computer World DVD Edition. (Code V135)

Your details

Title Initials Surname

Email

Address

Postcode

Telephone

Direct Debit details

Instruction to your Bank or Building Society to pay Direct Debits
Please fill in and send it to:
Personal Computer World, FREEPOST LON14776, Market Harborough, Leics, LE87 4NZ

Originator's Identification number: 9 4 2 5 7 9

1. Name and full postal address of your Bank or Building Society branch

To: The Manager Bank or Building Society

Address Postcode

2. Name(s) of account holder(s)

3. Branch Sort code

(from top right hand corner of your cheque)

4. Bank or Building Society account number

5. Reference number (for office use only)

6. Instruction to your Bank or BuildingSociety

Please pay VNU Business Publications Ltd Direct Debits from the account detailed on this instruction subject to the safeguards assured by the Direct Debit Guarantee. I understand that this instruction may remain with VNU Business Publications Ltd and, if so, details will be passed electronically to my Bank or Building Society

SIGNATURE DATE

We will use the details provided by you to contact you about your subscription
❑ Tick box to receive information about products and services from the VNU Group by email.
❑ Tick box to receive information about products and services from selected companies by email.
❑ Tick box if you do not want to receive information about products and services from the VNU Group by post/telephone.
❑ Tick box if you do not want to receive information about products and services from selected companies by post/telephone.
Offer available in the UK only - for overseas subscriptions please call 00 44 (0)870 830 4968 Offer ends 31st December 2005

How to buy the best products tested by our Labs

This Buyer's Guide is a comprehensive listing of the best products PCW has tested across a range of areas, helping you to make the best decision when you're planning a purchase. Over the following pages you'll find products, their verdicts and ratings, plus information on where you can read the full review.

BUYER'S GUIDE

137 PRODUCTS REVIEWED TO MAKE YOUR BUYING DECISION EASIER

CONTENTS

153 PCs
154 Graphics cards
Notebooks
155 Motherboards
Soundcards
156 Hard drives
DVD drives
157 Digital cameras
Digital camcorders
158 Printers
Scanners
159 Routers
Speakers
160 Monitors
TV tuners
161 Digital music players
Smartphones
PDAs
162 Portable media players
Personal video recorders
163 Backup software
Digital image-editing software
Media creation software
PC maintenance software
164 PC security, office & video-editing software
165 Product index

Prices are for guide purposes only and may be subject to change

HOW TO BUY: PCs

Many of the choices you are faced with when buying a PC are covered in the following pages. You need to think about the graphics card, memory, onboard sound or separate soundcard, size and type of hard disk, CD burner or DVD burner and so on.

Once your budget is set, the starting point is the CPU (central processing unit), because it is the brains of your PC.

Intel and AMD offer a bewildering number of processors. The differences between the CPUs are in technical details that don't necessarily mean much to end users. Pricing is also competitive, with AMD PCs generally cheaper than comparable Intel models.

Budget PCs come with Intel's Celeron or AMD's Sempron CPUs. These are aimed at undemanding users. If your needs are for word processing tasks and surfing the Internet with some low-end gaming or image editing, a PC running either of these processors is fine. You won't need a huge hard disk – 80GB will be plenty – coupled with between 256MB and 512MB of Ram and a low-end graphics card, or even onboard graphics for the truly undemanding. You'll be fine with onboard sound, and can expect to pay up to about £500, depending on your monitor.

In the mainstream desktop market it's Pentium 4 and Pentium D versus AMD's Athlon XP and Athlon 64. The chief difference is that older Pentium 4 and Athlon XP models are 32bit CPUs, while some newer Pentium 4s, the Pentium D and Athlon 64 are 64bit models. To take full advantage of this, you need a 64bit operating system and applications.

More memory can be supported by 64bit systems – 32bit Windows or Linux systems are limited to 4GB of Ram, whereas a 64bit Windows or Linux system can support 128GB. Data is also moved in larger chunks, allowing a theoretical speed advantage.

AMD and Intel offer high-end processors with the Pentium Extreme Edition and Athlon FX ranges, both aimed at the hardcore gaming market. They also have dual-core CPUs. These processors effectively act as two CPUs in one and offer superior performance.

If you're choosing a PC running the above CPUs, other considerations come down to your needs. If you store lots of music, video or photos, go for a big hard disk – 200GB or above. Memory will help speed up applications, so aim for 1GB or above and don't drop below 512MB. The latest games demand the latest graphics cards, but for most people, cards that were new six to 12 months ago will be powerful enough. And look at the CPU's cache memory, which helps eliminate data bottlenecks.

Most PCs are Windows XP, and the Home Edition is fine. If it's for a small business or you need features such as remote access, buy XP Professional. Few PCs are sold running Linux, and we'd recommend only the technically confident buy a Linux-only system. Linux can always be installed later. Finally, don't overlook the monitor, especially if you're using the PC for gaming or imaging; buy the best you can afford.

1

Chillblast Fusion X2 4400 GTX
£1,749.99 ★★★★★
Reviewed November 05, p72
www.chillblast.com
It's not cheap, but it houses a 20in screen, 7800 GTX graphics card and a dual-core Athlon 64 X2 4400+ processor.

2

Elonex Mediastar 1541 GTX
£1,398 ★★★★☆
Reviewed November 05, p42
www.elonex.co.uk
Running Media Center 2005, and with a 2GHz processor and 1GB of Ram, this is an entertainment powerhouse.

3

Dell Optiplex GX620
£715.58 ★★★★☆
Reviewed November 05, p46
www.dell.co.uk
Aimed at the corporate environment, this PC uses BTX technology to keep noise levels down.

GRAPHICS CARDS

SUB £200

1

Aopen Aeolus Geforce 6600GT
£116 ★★★★☆
Reviewed January 05, p82
www.aopen.com
Ageing, but well featured and a good choice for less demanding users.

2

Gigabyte Geforce GV-N68 128DH
£192.64 ★★★★☆
Reviewed January 05, p82
www.giga-byte.com
Offers strong performance and its passive cooling means completely silent operation.

3

Crucial Radeon X800 Pro
£183 ★★★★☆
Reviewed October 04, p77
www.crucial.com/uk
Crucial's Radeon X800 Pro is a cracking 256MB card with TV-out and DVI connectors.

£200–£349

1

Gecube Radeon X850XT Uniwise
£269.97 ★★★★★
Reviewed May 05, p71
www.gecube.com
A single-slot design using Gecube's own cooling system, and it offers good performance.

2

Powercolor Radeon X850XT Platinum Edition
£320 ★★★★★
Reviewed July 05, p70
www.powercolor.com
Based on ATI's fastest Radeon processor, this card will run the latest games with ease

3

Gecube Radeon X800XL
£209.97 ★★★★☆
Reviewed June 05, p72
www.gecube.com
This card uses Gecube's own Uniwise cooling with a noise level of just 20db.

4

HIS Excalibur Radeon X800 XT
£289.97 ★★★★★
Reviewed October 04, p77
www.hisdigital.com
The Excalibur X800 XT is one of the quietest graphics cards of its type, and one of the fastest too.

£350+

1

Aopen Aeolus Geforce 7800 GTX
£364 ★★★★☆
Reviewed October 05, p96
www.aopen.com
Uses the latest 7800 GTX chipset from Nvidia and is one of the cheapest versions around.

2

HIS Radeon X850XT Platinum Edition IceQII
£370 ★★★★★
Reviewed June 05, p72
www.hisdigital.com
Making use of the IceQII efficient cooling system, this is a quiet and super-fast card.

3

Gigabyte Geforce 7800GTX (NX78X256V-B)
£373.53 ★★★★☆
Reviewed October 05, p97
www.giga-byte.com
Fast, moderately priced and it comes with a decent software bundle.

HOW TO BUY

Most graphics cards are based on either the Nvidia Geforce or ATI Radeon family of chips. Each has their strengths and both offer state-of-the-art image acceleration and comparable features.

Performance improves as you move up a range. Top chips offer more features and draw more pixels or textures in a single pass than cut-down, lower-cost options. All current graphics processors are fine for office work, but hardcore gamers currently favour Nvidia's Geforce 6800 or new 7800 series and ATI's Radeon X850 XT chips.

Ensure the card you buy can display favoured resolutions with at least a 75Hz monitor refresh rate to avoid eye strain from flicker (if using a CRT monitor).

There are usually three clock speeds quoted (in megahertz). Core clock is the internal speed of the graphics processor. Memory speed (or memory clock) is the speed of data transfer between the graphics card's onboard memory and the graphics processor. Ramdac speed is the capability of the digital-to-analogue converter that provides the graphics output from the card.

Graphics cards use their own dedicated video memory to store data, images and textures. The more you have, the better the performance. A card with 64MB is fine for office tasks, but we recommend at least 128MB or 256MB for the latest games and video applications.

Around £40 will buy you a Geforce FX 5200 or Radeon 9200 card with 128MB of Ram, which is good for 2D action/strategy games, image editing and less demanding 3D games.

To play 3D action games smoothly, look at £100–£150 cards. Serious gamers should consider the Geforce FX 6800 GT at £280-plus, Radeon 850 XT at £320-plus, or FX 7800 GTX at £350-plus.

Depending on the motherboard, you'll need an AGP or PCI Express graphics card. PCI Express is the newest interface standard, offering up to double the bandwidth of an AGP 8x slot for even faster and more complex graphics. Both ATI and Nvidia offer PCI Express versions of most of their cards. Nvidia also has its SLI (Scalable Link Interface) technology that lets you use two PCI Express graphics cards in SLI-enabled motherboards for ultimate performance. ATI's rival technology Crossfire is due soon.

Look for support for both analogue (VGA) and digital (DVI) displays, and S-video and composite video outputs for use with TVs. Some 'all-in-one' cards have a built-in TV tuner and video-capture options, so you can save money rather than buying separate cards.

NOTEBOOKS

1

Acer Travelmate 8104 WLMI
£1,499 ★★★★★
Reviewed June 05, p104
www.acer.co.uk
It's not the smallest notebook, but the Travelmate 8104 WLMI is fast and very well equipped.

2

MV Mobeus 1.4 Celeron
£586 ★★★★★
Reviewed October 05, p87
www.go-mv.com
A highly portable, feature-packed notebook that's also very affordable.

3

Evesham Quest T28
£599 ★★★☆☆
Reviewed October 05, p85
www.evesham.com
A good spec and excellent battery life, but integrated graphics means it's not a gaming notebook.

4

Evesham Quest Roma T37
£899.98 ★★★★☆
Reviewed September 05, p56
www.evesham.com
A great notebook that shows AMD CPUs can compete with Intel at a fraction of the cost.

5

Sony Vaio VGN-S3XP
£1,800 ★★★★☆
Reviewed June 05, p110
www.sony.co.uk
Arguably the best ultraportable we've seen, but let down slightly by its inadequate cooling.

HOW TO BUY

Notebooks have caught on like wildfire with consumers thanks to plummeting prices and massive marketing campaigns. However, there are so many options that it's easy to get confused.

Decide what you want your notebook for. If it's for occasional use, running some office applications, accessing the Internet and email, then almost any low-cost notebook will do the job. If it's for gaming or running video-editing software, you will be looking for a notebook with a large 15in/17in screen – possibly widescreen – a high-end Nvidia or ATI graphics chip, 1GB of memory and an 80GB (or bigger) hard disk.

In the low-cost arena, Intel has its Mobile Celeron chip and AMD has Sempron. In the midrange/high-end space, there are Intel's Mobile Pentium 4 or Pentium 4 chips, while AMD offers Mobile Athlon 64 and Athlon 64. Expect to find these in desktop replacement systems and those used by gamers.

For the best in performance with power-saving technology, go for Intel's Pentium M or AMD's Turion 64 processors.

Any notebook you get should have in-built Bluetooth and Wifi connectivity, a 30-40GB hard disk drive, 512MB of Ram, 14-15in screen, USB2 or Firewire ports, DVD/CD-RW combo drive and three to four hours' battery life.

MOTHERBOARDS

SUB £100

1

ECS PF88
£64.63 ★★★★☆
Reviewed August 05, p55
www.ecs.com.tw
The PF88 is feature-packed and compatible with both Intel and AMD processors.

2

Aopen i915GMm-HFS
£79 ★★★★☆
Reviewed July 05, p69
www.aopen.com
The HFS makes the ideal platform for building a quiet, power-efficient Intel PC.

3

Asus A8N-SLI Deluxe
£98 ★★★★☆
Reviewed April 05, p78
www.asus.com
A good, all-round AMD SLI board that is packed with plenty of features.

4

ECS 915-A
£61.81 ★★★★☆
Reviewed June 05, p70
www.ecs.com.tw
All the features you'd expect from a modern Intel-based motherboard and outstanding value for money.

5

Asus K8N-E Deluxe
£59 ★★★★☆
Reviewed November 04, p80
www.asus.com
A tidy AMD board with lots of room around the major components and a wide range of features.

6

Epox 8HDA3+
£79.92 ★★★☆☆
Reviewed July 04, p132
www.epox.com
An AMD board that stands out from the crowd thanks to its dual Lan and external Sata support.

7

MSI 945P Platinum
£99 ★★★☆☆
Reviewed November 05, p58
www.msi.com.tw
An Intel board that features DTS Connect, so you can output true DTS surround-sound audio.

£100+

1

Gigabyte GA-8N-SLI Royal
£149 ★★★★☆
Reviewed October 05, p54
www.giga-byte.com
Featuring an Nforce4 chipset, this model from Gigabyte supports all Intel 775 processors.

2

Abit Fatal1ty AN8
£119.80 ★★★★☆
Reviewed August 05, p65
www.abit.com.tw
This AMD board has enough flexibility and Bios features to keep overclockers happy.

3

MSI 925X Neo Platinum
£114.99 ★★★★★
Reviewed November 04, p80
www.msi.com.tw
Well laid out, reasonably priced and ideal for use with the latest Intel Pentium 4 CPUs.

HOW TO BUY

The motherboard dictates the type of processor you can use, how well the other components communicate, the features on offer and future upgrade potential.

Cheap boards limit processor support, graphics and expansion options. Around £70–£100 gets you the latest technologies.

Most desktop and tower cases use a standard ATX-size motherboard but, if you're building a small system, look at compact MiniATX or MicroATX designs. If using an existing case, make sure you buy the right form factor.

Your choice is also dictated by the processor. You'll need Socket 775 for current Intel processors, Socket A for AMD Athlon XP or Duron, and Socket 939 for an Athlon 64. The Athlon 64 FX series requires Socket 940. If using an older CPU, check the socket type.

We would recommend an Intel P4 or Athlon 64 for a good all-round system. The Athlon 64 can address one terabyte of Ram (1,000GB) and handle difficult calculations with relative ease.

The new generation of processors also change the way data is transferred. Whereas P4s rely on the motherboard chipset to shuttle data between processor and memory, Athlon 64s avoid this by integrating the memory controller into the CPU die.

Divided into northbridge and southbridge, the chipset handles the communication between all the components and dictates the features on offer. Today's leading chipset manufacturers include Via, Silicon Integrated Systems (Sis), ATI, Nvidia and Intel. Chipsets can include integrated graphics.

Today's motherboards mainly use DDR or DDR2 Ram, available in 200, 266, 333 and 400, 667 and 800MHz modules.

Also consider the number of slots available. Fit dual in-line memory modules (Dimms) in pairs if the chipset supports dual-channel operation.

The latest boards support both older IDE and new, faster Serial ATA (Sata) hard disks. Check the number of connectors available for both.

Some chipsets provide Raid support, so data can be spread across two drives for extra performance or backups. SCSI controllers can be found on more expensive boards, or be added with expansion cards.

Also important is the number of USB2 and Firewire sockets for external add-ons. You may need serial, parallel and PS/2 interfaces if using older legacy peripherals. Look out, too, for onboard Ethernet networking, a built-in 56K modem and onboard sound. The latter is fine for all but audio buffs or avid gamers.

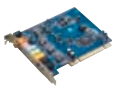
SOUNDCARDS

1

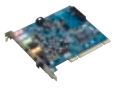
Creative Audigy X-Fi
£249 ★★★★☆
Reviewed November 05, p48
http://europe.creative.com
This latest Creative offering has a variety of features, but will take time to be fully supported.

2

Creative Audigy 4 Pro
£179.99 ★★★★☆
Reviewed July 05, p110
http://europe.creative.com
This updated version of Audigy 2 has fantastic performance and a good software bundle.

3 

M-Audio Revolution 7.1
£99 ★★★★☆
Reviewed July 05, p111
www.m-audio.com
An excellent mid-priced soundcard offering great audio quality, but gamers might be disappointed.

4 

Hercules Fortissimo IV
£44.99 ★★★★☆
Reviewed July 05, p110
www.guillemot.co.uk
If you're looking to upgrade your system, but have a limited budget, this is an excellent option.

5

Terratec Aureon 7.1 Universe
£114 ★★★★☆
Reviewed July 05, p112
www.terratec.com
We wouldn't recommend this over the Audigy 4 for gamers, but musicians may be tempted.

HOW TO BUY

Many PCs have built-in surround sound on the motherboard. Some support six-channel (5.1), others eight-channel (7.1) and the sound quality is fine for most people.

If you want a dedicated soundcard for playing and making CDs and mp3s, DVDs and games, most will fit the bill.

Entry-level soundcards support 16bit-quality sound recorded or played back at 44.1KHz, which is CD-quality. The next step is 24bit sound at higher sampling rates of 48KHz or 96KHz, recommended for those creating music or playing DVD movies with THX surround or Dolby Digital EX 6.1 or 7.1 sound formats. More cards now also support 24bit 192KHz playback, required for the DVD-Audio music format.

The signal-to-noise (SNR) ratio, measured in decibels (dB), is the amount of sound you expect (signal) versus that which you don't (noise). Decibel ratings range from 60dB to over 100dB and the higher the dB rating, the better.

Most cards share many similar options, such as microphone-in, line-in/line-out, line-out, Midi/joystick port, CD-in and headphones connectors. Newer cards also have high-speed Firewire ports. Audio enthusiasts should look for S/PDIF (Sony/Philips Digital Interface) -in and -out, to connect speakers via a single optical or coaxial cable and get higher quality digital sound. ↘

HARD DRIVES

INTERNAL

1

Seagate Barracuda 7200.7 160GB NCQ
£92 ★★★★★
Reviewed December 04, p71
www.seagate.com
Good performance with an 8MB cache and 8.5ms seek time – and you can buy bigger capacities.

2

Seagate Barracuda 7200.8 (ST3400832A)
£186.96 ★★★★☆
Reviewed July 05, p70
www.seagate.com
This massive 400GB drive offers impressive capacity and an 8ms seek time.

3

Hitachi Deskstar 7K250 (250GB Sata150)
£88 ★★★★★
Reviewed May 04, p65
www.hitachi.co.uk
Those needing a large Sata150 drive will find this a great bargain.

4

Hitachi Deskstar 7K250 (250GB ATA)
£111.86 ★★★★☆
Reviewed May 04, p64
www.hitachi.co.uk
An 8MB cache, 7,200rpm speed and great performance make this 250GB drive a superb buy.

5

Western Digital Caviar WD1600JD (160GB Sata150)
£72.61 ★★★★☆
Reviewed May 04, p66
www.wdc.com
With dual power connectors this drive will suit users transitioning to Sata technology.

EXTERNAL

1

Maxtor Onetouch II Firewire 800
£179 ★★★★★
Reviewed November 05, p54
www.maxtor.com
A good-quality 300GB USB and Firewire hard drive that comes with backup software.

2

Smartdisk Firelite
£189.98 ★★★★☆
Reviewed October 04, p71
www.smartdisk.co.uk
Available with either USB or Firewire interfaces, it's a great performer at an attractive price.

3

Ximeta Netdisk Mini
£170.38 ★★★★☆
Reviewed October 04, p71
www.ximeta.com
With USB and Ethernet connections, this disk is versatile although it's quite bulky.

4

Siwara SW Pocket
£246 ★★★★★
Reviewed October 04, p71
www.hki-systems.co.uk
Excellent software and a miniature form factor make this a great product.

5

Buffalo Linkstation
£240 ★★★★★
Reviewed October 04, p71
www.buffalotech.com
If you want easy-to-use external network storage, this is a great choice.

HOW TO BUY

If you're building a high-performance system, buy the fastest drive you can afford; if you just want lots of capacity then slower drives offer better value.

OEM or 'brown box' drives are cheaper – this is the bare drive without the extras, such as cables, included in retail boxed versions.

The transfer rates in today's Ultra ATA drives are 100Mbytes/sec (133Mbytes/sec for Maxtor drives), while Serial ATA (Sata) drives are rated at 150Mbytes/sec. Check the seek times, spindle speed, buffer size and the areal density of the platters (disks).

Usually in milliseconds, seek time is how long a drive's heads take to find data on the disk. The speed at which the spindle holding the disks spins ranges from 4,200rpm for a notebook drive to 15,000rpm for some SCSI drives. Generally, faster speeds give better performance.

The larger the buffer (cache), the more recently written or stored data is held in the drive's memory, resulting in less time seeking the data on the disk.

Areal density is the amount of data stored on a given area of a drive's platter. The more data per square centimetre (gigabytes per platter), the less disk movement is required to bring it under the heads.

Originally Integrated Drive Electronics (IDE), then Enhanced IDE (E-IDE), this common parallel interface is usually written as ATA (AT Attachment), modified with speed improvements in recent years to Ultra ATA/xxx, where xxx is the peak bandwidth in Mbytes/sec. To differentiate Ultra ATA from Sata, the term Parallel ATA is used.

Faster Sata drives are more expensive than Parallel ATA. Sata uses two pairs of high-frequency cables, working at low voltage.

SCSI (Small Computer System Interface) drives are technically no different to ATA drives, but support up to 16 devices on a single channel and you can have multiple channels in a PC. The disadvantage, though, is price.

Most motherboards support Raid (Redundant Array of Independent Disks), which connects multiple drives, to improve performance or provide fault tolerance.

One problem you may hit is the inability to access the new drive's full capacity. Some older Bioses only support drives up to 137GB. This may be solved by updating the PC's Bios. Retail boxed disks often come with software to fool the Bios into recognising the disk, or you can buy a separate disk controller card, which fits into a PCI slot.

DVD DRIVES

1

Toshiba SD-R6472
£83.42 ★★★★☆
Reviewed September 05, p76
www.span.com
A slimline dual-layer DVD writer that performs well and is perfect for small form factor PCs.

2

Philips DVDR16LSK
£59.99 ★★★★☆
Reviewed October 05, p53
www.philips.co.uk
An excellent Lightscribe-capable dual-layer DVD burner that's very keenly priced.

3

LG 12X Super Multi DVD
£116.99 ★★★★☆
Reviewed January 05, p68
www.lge.co.uk
Good-value external USB2/Firewire rewriter with all-format media support.

4

Plextor PX-716A
£105 ★★★☆☆
Reviewed April 05, p69
www.plextor.com
This dual-layer DVD burner combines good performance and a decent software package.

5

Lite-On SHOW-832S
£110 ★★★★☆
Reviewed November 04, p75
www.liteonit.com
A little noisy, but one of the best-value external USB2 dual-layer burners around.

HOW TO BUY

DVD drives have largely replaced CD-Rom, CD-R and CD-RW drives in all but a few entry-level PCs and notebooks. Many systems still offer DVD-Rom drives as secondary drives – used for playback of discs only – while a growing number have a DVD writer or rewriter for burning your own DVDs as the main system drive.

DVD burners can be divided into internal and external drives. Internal drives are cheaper than their external counterparts, but require a level of knowledge so you can install them yourself. You can opt for one of the external offerings which can be hooked up simply via USB2 or Firewire.

Most drives are multi-format, meaning they can write to all key media types, so make sure yours supports DVD+R, DVD+RW, DVD-R and DVD-RW discs. Newer double and dual-layer drives can write to new discs which can store 8.5GB versus the 4.7GB capacity of existing discs. This is useful for backing up your DVD movie collection or chunks of your hard drive on a single disc.

The dual-layer drives cost little more than single-layer drives, so are a good investment. The same cannot be said for the cost of dual-layer discs. A branded, dual-layer 8.5GB disc will cost around £3.75. Rewriteable dual-layer discs will not arrive until the end of 2006.

DIGITAL CAMERAS

COMPACT

1

Canon Powershot A520
£239 ★★★★★
Reviewed July 05, p57
www.canon.co.uk
Perfect for those who want a versatile and easy-to-use digicam without spending a fortune.

2

Nikon Coolpix S1
£229 ★★★★★
Reviewed August 05, p111
www.nikon.co.uk
Small enough to fit in the tightest of pockets – and quality images to boot.

3

Casio Exilim Zoom EX-Z57
£229 ★★★★★
Reviewed August 05, p110
www.casio.co.uk
Another quality compact, with the added bonus of a manual focus and a 2.6in monitor.

4

Pentax OptioWP
£175 ★★★★☆
Reviewed June 05, p69
www.pentax.co.uk
This is a durable, stylish waterproof camera with 3x optical zoom that performs well.

5

Canon Ixus i5
£182 ★★★★☆
Reviewed August 05, p110
www.canon.co.uk
Small size means no optical zoom and images are a bit soft at the edges, but it takes decent photos.

6

Pentax Optio S5n
£249 ★★★★☆
Reviewed August 05, p112
www.pentax.co.uk
Small, but loaded with features including a histogram and manual focus.

PROSUMER

1

Fujifilm Finepix S5500 Zoom
£179 ★★★★☆
Reviewed February 05, p54
www.fujifilm.co.uk
Good-quality prosumer camera with plenty of features and a good 10x optical zoom.

2

Fujifilm Finepix S7000
£299 ★★★★☆
Reviewed June 04, p56
www.fujifilm.co.uk
Great design and loaded with features, this camera performs well and is a delight to use.

3

Canon Powershot PRO1
£400 ★★★★★
Reviewed July 04, p62
www.canon.co.uk
A well-designed camera for the serious user who wants stunning photos.

4

Nikon Coolpix 8700
£402 ★★★★☆
Reviewed July 04, p62
www.canon.co.uk
Features an impressive 280mm telephoto lens and 30fps (frames per second) movies.

HOW TO BUY

Decent 4-5megapixels point-and-shoot digital cameras start from about £150, while enthusiasts looking for flexibility can buy a new fully featured digital SLR for under £600.

In general, the higher the megapixel count of a digital camera's sensor – and the bigger the sensor's physical size – the more detailed the images.

Four to 5megapixels is good for 8 x 10in or larger prints. The quoted 'effective' pixels number is the camera's true megapixel resolution.

Forget digital zoom and concentrate on the optical zoom, which zooms in on the subject and produces a better-quality image. Digital zooms simply crop into the centre of the picture.

Also be wary of interpolation – a technique that mathematically inserts new pixels in between existing ones. It can result in blurry pictures.

The minimum optical zoom is typically 3x; about 35-105mm. If buying an SLR, multiply a lens size by 1.6 to get its true focal length, so a 100mm lens is 160mm when put on a digital body.

Look at the selection of automatic or preset picture modes for standard shots, portraits, night shots and landscapes, plus macro modes for close-up photography.

Movie modes aren't as good as even a basic camcorder, but are fine for short movie clips to play on your PC. Check how many frames per second (fps) they offer – most are 15fps, but some are 30fps, which means the video will be smoother.

Experienced photographers will want manual controls for aperture and shutter priority, white balance and focusing. Good cameras should also provide quick and easy access to image quality, resolution and format settings.

Built-in flashes are fine for everyday shots, and many include a red-eye reduction mode, but cameras with a hot-shoe for external flashes will allow much greater illumination and control over lighting.

Check start-up time because cheaper models are likely to take longer to be ready from switch-on. And check shutter lag, as there may be a delay between pressing the button and taking the photo.

Many models use NiMH (nickel-metal hydride) rechargeable batteries, but lithium batteries typically last longer. Also, smaller cameras often mean smaller capacity batteries.

Finally, remember digicams must write the image onto flash media before taking the next shot, and the better quality the card, the faster this will happen.

CAMCORDERS

1

Sony DCR-HC19E
£297.87 ★★★★☆
Reviewed September 05, p63
www.sony.co.uk
An excellent low-cost camcorder with a touchscreen LCD and good video software.

2

Canon MV850i
£349 ★★★★☆
Reviewed September 05, p63
www.canon.co.uk
Simple to use and good quality, although it doesn't come with video-editing software.

3

JVC GR-DF420
£339.57 ★★★★☆
Reviewed September 05, p63
www.jvc.co.uk
A good all-round performer with excellent image quality and lots of features.

4

Samsung VP-D453
£280.84 ★★★☆☆
Reviewed September 05, p63
www.samsung.co.uk
An attractive, compact camcorder with a good range of features and decent-quality images.

5

Panasonic NV-GS21
£322.54 ★★★☆☆
Reviewed September 05, p63
www.panasonic.co.uk
A robust model with good image quality and a wide range of connectivity options as standard.

HOW TO BUY

Smaller camcorder designs are easy to carry, but can be awkward for larger hands.

The MiniDV format is usually in mid-range to high-end models. Digital-8 is entry-level and plays analogue Hi8 and 8mm tapes.

Some digicams record directly to DVD-R/RW and Ram, or solid-state memory cards. The amount of data needed for quality video makes the latter impractical. Sony's tiny MicroMV is a better alternative. Cassettes are smaller than MiniDV and it stores video in mpeg-2. Files are smaller for editing, but you'll need software that accepts this type of data.

Look at optical zoom and forget digital zoom. Around 10x is normal, with up to 20x for more expensive models.

To transfer edited images back to tape you'll need a DV-in and out Firewire (Ilink/IEEE 1394) port. Otherwise DV-in is fine to transfer footage to your PC.

Built-in microphones are susceptible to noise, so look for a 3.5mm jack or an accessory shoe and use a separate mic.

Most digicams take still photos, but limited resolutions mean you're better off with a dedicated stills camera. In addition, look for image stabilisers (optical is better than digital) and a good range of AV connectors. Some camcorders have a USB port, so they can be used as a webcam. ↘

PRINTERS

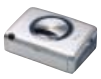
PHOTO PRINTERS

1

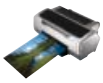
Canon Pixma IP5000
£129 ★★★★★
Reviewed June 05, p60
www.canon.co.uk
If it's pixel-perfect printing you're after, look no further than the IP5000 – a real bargain.

2

HP Photosmart 8450
£170 ★★★★★
Reviewed April 05, p68
www.hp.com/uk
HP's Photosmart 8450 is a bulky printer, but it's capable of producing stunning photo prints.

3 

Canon Selphy CP-600
£199 ★★★★★
Reviewed September 05, p70
www.canon.co.uk
The best compact photo printer we've looked at in terms of quality and price.

4 

Epson Stylus Photo R1800
£353 ★★★★☆
Reviewed September 05, p68
www.epson.co.uk
It might be expensive, but the R1800 is one of the best large-format printers we've seen.

MULTIFUNCTION DEVICES

1

Brother DCP-310N
£99 ★★★★☆
Reviewed February 05, p54
www.brother.co.uk
Complete range of scanning and printing features, along with an Ethernet port for network usage.

2

Lexmark P4350
£116 ★★★★☆
Reviewed October 05, p45
www.lexmark.co.uk
Well-designed device that produces good-quality photo prints, with some useful features.

LASER PRINTERS

1

Dell 1600n
£236 ★★★★☆
Reviewed September 05, p69
www.dell.co.uk
A good multifunction mono laser, perfectly suited to small or home offices.

2

Canon LBP-5200
£224 ★★★★☆
Reviewed October 05, p45
www.canon.co.uk
A great-value colour laser printer that's both small and capable of delivering quality prints.

3

Dell Laser Printer 1100
£93 ★★★★☆
Reviewed November 05, p49
www.dell.co.uk
A cheap mono laser printer, but it comes with a relatively small starter toner cartridge.

4

HP Laserjet 1020
£89 ★★★★☆
Reviewed August 05, p55
www.hp.com/uk
A great home laser printer that's fast, good quality and is one of the cheapest lasers available.

HOW TO BUY

If you don't need colour, consider a monchrome laser or LED printer. The latter tend to be cheaper and may last longer than a laser, but LED printers have a fixed resolution and can't take advantage of software-based resolution enhancements.

If you print hundreds of pages a week, a laser is the best option as they're cheaper and more reliable for high-volume printing. If you print a few pages a month, buy a cheap colour inkjet. If printing high-quality colour photos, buy a good photo printer.

Look for the manufacturer's quoted 'duty cycle' – this is how many pages a month the machine can handle. Choose a duty cycle three or four times larger than your expected average usage. Also check the printer's 'engine life' or 'total print volume' – after this expires, the printer's on borrowed time and uneconomical to repair.

Quoted printer speeds often refer to the speed the printer pushes a blank sheet of paper through the mechanism; for documents they tend to refer to lower quality settings. PCW's tests use real documents and photos, giving a better idea of print speed.

For serious inkjet photo printing, consider higher-end models that use six, seven or eight colour cartridges. Normal inkjets use three colours (cyan, yellow and magenta) plus black, while specialised photo printers add extra shades to improve colour fidelity. Cheaper models often combine three colours in a single cartridge, which is not as economical as using separate cartridges for each colour.

Some 'convertible printers' use four separate black cartridges for longer-life mono printing and you can replace three of them with cyan, magenta and yellow cartridges for colour printing.

Laser models for business use often have a large number of paper-handling options. They're usually modular so you can add features as required. They also have a wider range of interface options and consumables.

You'll often find bundled software with a printer. Their quality varies, but there can be some useful programs.

The quality and usability of the driver software is vital, but it's difficult to assess before buying. Check PCW's reviews and online forums (www.pcw.co.uk/forums) and read the manufacturer's technical support site for any known problems.

Third-party or refurbished consumables generally work fine, but can cause problems with quality and reliability. Your warranty may not cover the use of non-approved consumables.

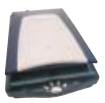
FLATBED SCANNERS

1

Epson 2480 Photo
£79 ★★★★★
Reviewed February 05, p60
www.epson.co.uk
It's rather large, but is easy to use and includes a transparency adapter.

2

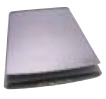
HP Scanjet 3770
£69 ★★★★☆
Reviewed February 05, p60
www.hp.com/uk
You get plenty of scanning options, plus it's fast and produces good image quality.

3 

Mustek Bearpaw 4800TA Pro II
£69 ★★★★☆
Reviewed February 05, p61
www.mustek.com
Simple to install and it includes a built-in transparency adapter with automatic cropping.

4

Visoneer Onetouch 9220 USB
£99.99 ★★★★☆
Reviewed February 05, p61
www.visioneer.com
You get plenty of features for your money, and it produces good-quality scans.

5 

Canon Lide 35
£59 ★★★☆☆
Reviewed February 05, p60
www.canon.co.uk
Compact, stylish with some useful software, but it doesn't include a transparency adapter.

HOW TO BUY

Flatbed scanners are the simplest way of digitising your old photos. Whether you just want to back them up on your PC, email them, stick them on a website or edit them, just hook up a scanner to your PC or notebook and off you go.

That said, not all scanners are created equal and there is a huge choice out there. Here are some key features to look out for to make it easier.

A good scanner will connect via USB2 or Firewire. Try and avoid older models offering USB1.1 since large scans can take a while to transfer to your PC. It should also offer at least 48bit colour depth and a resolution of 2,400 x 2,400dpi. This is more than enough for scanning photos or documents.

Also look out for a 35mm slide adapter for scanning slides or, even better, an automatic film loader that allows you to insert your film negatives or slides for simple scanning and enlargement.

On the software front, see if your model comes with tools that allow you to fix and edit the photos. This can include anything from removing red-eye, to colour restoration and eliminating dust and cracks. Some entry-level models even come with a cut-down version of the leading professional editing software, Adobe Photoshop.

ROUTERS

WIRELESS/MODEM

1

Netgear 108 ADSL router
£159 ★★★★☆
Reviewed April 05, p71
www.netgear.co.uk
If you need a Super-G router with built-in ADSL modem, this offering from Netgear is great value.

2

Ozenda 11g ADSL Router
£70 ★★★★★
Reviewed November 04, p72
www.ozenda.com
Ozenda has come up trumps – wireless ADSL doesn't get any easier than this.

3

3Com Office Connect ADSL Wireless 11G
£59 ★★★☆☆
Reviewed August 05, p138
www.3com.co.uk
A wireless ADSL router that's good for Soho environments and simple to set up and configure.

WIRELESS

1

Linksys WAG54G (wireless)
£76 ★★★★★
Reviewed August 05, p138
www.linksys.com
This 802.11g wirleless model offers advanced features for home and professional users.

2

Netgear WGT634U
£106 ★★★★☆
Reviewed August 05, p139
www.netgear.co.uk
Good design, high quality and easy configuration make this a great wireless choice.

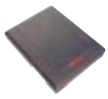
3

Draytek Vigor 2600G
£151 ★★★★☆
Reviewed August 05, p138
www.draytek.co.uk
With plenty of options, it's designed for users looking for advanced settings.

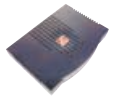
4

Belkin Wireless Pre-N router
£119.99 ★★★★☆
Reviewed April 05, p70
www.belkin.com
Excellent coverage and easy installation and configuration make this a great product.

VOIP

1 

Intertex IX66+ ADSL Airsip GW (wireless VoIP)
£269.08 ★★★★★
Reviewed March 05, p67
www.intertex.se
For a small business needing multi-user VoIP telephony, the Intertex IX66+ is hard to beat.

2 

Zoom Zoomtel X5V
£100 ★★★★☆
Reviewed March 05, p67
www.zoom.com
For a no-fuss VoIP solution at home, the Zoomtel X5V is worth considering.

3

Draytek Vigor 2500V
£139.83 ★★★★☆
Reviewed March 05, p68
www.draytek.co.uk
A great wired router for those wanting to reap the benefits of VoIP telephony.

HOW TO BUY

The router is at the heart of any home network. Costing less than £100, they are an inexpensive way to exploit the advantages of being able to share information between the computing devices in your home.

A router is a simple networking device to which you connect your PCs and notebooks using a network cable. They often include built-in firewalls and other security measures, making them ideal for protecting your PCs from intruders.

The router connects to your broadband modem, as long as your modem uses an RJ45 Ethernet connection – most routers don't support USB modems. Special broadband routers, also called ADSL gateways, come with built-in ADSL modems. If your broadband is provided via a cable company's set-top box, you should buy a standard router without a built-in modem.

Once hooked up, your devices can share the broadband connection as well as swap data and let you play networked games. Wireless (Wifi) routers are increasingly popular in the home market, allowing devices to remotely connect to the Internet and each other without the need for cables – but wireless routers also usually have ordinary network (Ethernet) ports to let you connect non-wireless devices.

Wireless standards

802.11b This was the first and, until recently, the most common wireless variant used. With transmission speeds of just 11Mbits/sec it is also the slowest. It also used the 40bit Wireless Equivalency Privacy (Wep) security protocol, which was found to have a number of holes. An updated version of this, 802.11b+ boosted speeds to 22Mbits/sec.

802.11g This is now the mainstream standard in use, offering more respectable data transfer speeds of up to 54Mbits/sec – although in reality speeds are much lower. It also uses the more robust Wifi Protected Access (WPA) security protocol. Both 'b' and 'g' products can work together, which is handy if you have older 802.11b kit you still wish to use on your home network.

802.11n This is still in the process of being officially ratified and will not arrive in its final form until next year. It promises real data transfer speeds of 100Mbits/sec and, theoretically, up to 300Mbits/sec as well as increased range. At the moment there are two competing groups battling for supremacy. There are already numerous 'Pre-N' or 'Mimo' routers available that offer significant data transfer speeds over 'g' routers.

SPEAKERS

1

Creative Gigaworks S750
£237 ★★★★★
Reviewed April 04, p48
http://europe.creative.com
Although no Dolby Digital encoder is included, the sound quality and construction are superb.

2

Logitech X-530
£59.99 ★★★★☆
Reviewed July 05, p114
www.logitech.co.uk
Sleek design, great sound quality and a performance that belies the bargain price.

3

Hercules XPS5-101-Black
£99.99 ★★★★☆
Reviewed July 05, p115
www.guillemot.co.uk
Excellent build quality, easy to set up, lots of power and a fantastic remote control.

4

Creative Inspire T7900
£99.99 ★★★☆☆
Reviewed July 05, p115
http://europe.creative.com
A 7.1 surround system with surprisingly good sound quality, but it won't cost you a fortune.

5

Logitech Z-5500 Digital
£279.99 ★★★☆☆
Reviewed July 05, p115
www.logitech.co.uk
With a built-in Dolby Digital decoder, this set also delivers impressive audio performance.

HOW TO BUY

PC speakers have come a long way, with most manufacturers now offering 2.1, 5.1, 6.1, 7.1, and even 8.1 packages.

Here are three things to watch for when you're looking to buy. First is the output, often expressed in watts. Try to look beyond the manufacturer's statements, as they can be misleading. For instance, a 125w output might comprise a 100w sub-woofer and five 5w speakers. You may see speaker output quoted as PMPO (Peak Music Power), which relates to the maximum output that can be achieved under perfect conditions and is misleading. Lastly, there is RMS (Root Mean Square), which is expressed in watts, for example total 200w RMS. This is a better reference for overall power, but not perfect.

Impedance is measured in ohms and tells you how much of an electrical load a speaker presents to the amplifier.

The higher the impedance, the less power the amplifier needs to drive it. The average on most speakers is 8ohms. If lower than 8ohms the amplifier has to work harder to drive the speakers, which can result in distortion.

Frequency response refers to a speaker's tonal qualities and its ability to reproduce sounds at different frequencies. Speakers listed as having a response of 20Hz-20KHz are the most common for PC speakers. ↘

MONITORS

17IN

1

Samsung Syncmaster 173P
£237 ★★★★★
Reviewed November 04, p117
www.samsung.co.uk
Ergonomic, with a good picture quality, if slightly under-saturated, and the screen is very adjustable.

2

Viewsonic VP171B
£229 ★★★★☆
Reviewed November 04, p118
www.viewsonic.com
The VP171B has great picture quality, but the viewing angles are slightly restrictive.

3

Shuttle XP17 Temp AR (17in TFT)
£453 ★★★☆☆
Reviewed June 05, p68
www.shuttle.com
A clear bright screen that's stylish and portable, but a little on the expensive side.

19IN

1

Acer AL1922HS
£279 ★★★★★
Reviewed September 05, p98
www.acer.co.uk
The AL1922HS offers a great balance of features, performance and price.

2

CTX S966A
£219 ★★★★☆
Reviewed September 05, p99
www.ctxeurope.com
Excellent value for money and looks a lot more expensive than it really is.

3

Samsung Syncmaster 913N
£229 ★★★★☆
Reviewed September 05, p100
www.samsung.co.uk
A great combination of features and quality for this 8ms model, but lacks DVI connectors.

4

Viewsonic VP191b
£349 ★★★★☆
Reviewed July 05, p68
www.viewsonic.co.uk
It has a fast 8ms response time, easy-to-use menus and excellent picture quality.

20IN+

1

LG Flatron L2013P
£549 ★★★★☆
Reviewed October 05, p48
www.lge.co.uk
Well designed, high-performance monitor, with ergonomic features making it good for prolonged use.

2

Viewsonic VP201
£530 ★★★★★
Reviewed August 04, p54
www.viewsonic.co.uk
If you need a high-resolution 20in panel, the the VP201 is a good choice.

3

Fujitsu-Siemens Scenicview P20-2
£492 ★★★☆☆
Reviewed August 05, p56
www.tracline.co.uk
Fairly good all-rounder for the price, good clarity, but didn't accurately render some tones.

HOW TO BUY

CRT (cathode-ray tube) monitors are less fashionable, mainly due to the rapidly dropping prices of TFT (thin-film transistor) flat-panel models. But CRT technology is more than 100 years old and has a lot of strengths. CRTs are bulky, heavy and power-hungry, but are now excellent value for money.

Resolution is the number of graphics elements displayed on a screen. Known as pixels, they are generated by your graphics card. In any TFT or LCD, each pixel is composed of three sub-pixels coloured red, green and blue. In a CRT the pixels are spread in a grid across the screen separated by a distance called the dot pitch. The smaller the dot pitch, the sharper the image.

With TFTs, each pixel is composed of three rectangular thin-film transistors. The number of pixels equals the 'native' resolution; a 1,024 x 768 TFT will have exactly that number of pixels horizontally and vertically.

CRTs usually have a higher resolution than a TFT of the same size and work perfectly at any standard resolution up to the quoted maximum. Running a TFT below its native resolution can result in a poor picture.

Check your TFT's native resolution meets your needs – gamers wanting 1,600 x 1,200 will probably need an expensive 20in model – most 19in panels are currently limited to 1,280 x 1,024 and budget 14/15in models might only support 800 x 600.

Modern TFTs can be viewed from a wide range of angles vertically and horizontally, but anything over +/- 45° makes no difference in normal use.

Response time is the time taken for a pixel to reach maximum brightness – 12-25ms is typical – faster is better. Some newer monitors now have response times of 4ms or 8ms.

TFTs have high quoted contrast ratios, but this is often a maximum figure. Evenness of lighting is more important than the overall brightness specification.

The ISO 13406-2 standard specifies minimum requirements for display contrast, viewing angle, brightness, reflections, flicker, contrast and defective pixels. You may see the standard incorporated in a TUV label with the words 'Ergonomics Approved' or 'ISO 13406-certified'. The TCO'95 and '03 standards cover electromagnetic emissions, noise and ergonomics – ensure the monitor has at least one of these. ISO 13406-2 has stringent standards for defective pixels. Only Class I TFTs are guaranteed no defective pixels – most consumer models are Class II. Some manufacturers offer some dead pixel guarantees with Class II TFTs.

TV TUNERS

1

Nebula Digitv
£99.95 ★★★★★
Reviewed August 05, p58
www.nebula-electronics.com
This external USB2 tuner has a built-in web server to let you share TV over your network.

2

Twinhan Magic Box
£69.99 ★★★★☆
Reviewed August 05, p59
www.twinhan.com
A stylish external USB2 tuner with good software and an attractive price.

3

Terratec Cinergy 400 TV
£89.99 ★★★★☆
Reviewed March 05, p63
http://en.terratec.net
A PC Card-based analogue tuner with good software, it's a great buy for laptop users.

4

Visionplus VisionDTV
£69.99 ★★★★☆
Reviewed November 04, p68
www.twinhan.com
A bargain price and top-notch features make this a must-buy USB2 digital TV tuner.

5

Avermedia Avertv DVB-T USB2
£84.99 ★★★★☆
Reviewed August 05, p59
www.averm.co.uk
The Avertv impressed us with its sheer simplicity, and its small size makes it ideal for notebook users.

HOW TO BUY

Internal TV tuners require a PCI slot. External options connect via USB and are easier to set up. Hi-speed USB2 is often needed and devices typically require Windows ME, 2000 or XP. Check if you run Windows 98 or NT.

A Freeview digital tuner offers the best channel choice, picture and sound, but may need an outdoor aerial or a wideband aerial (you can check at www.freeview.co.uk). Analogue terrestrial TV tuners may give better results if using an indoor receiver. If a digital tuner receives radio it doesn't always mean digital audio broadcasting (DAB) support. Look for Teletext and subtitle support.

Digital tuners record to disk for maximum quality; analogue signals need to be digitally encoded – look for mpeg-2 hardware for realtime video and audio encoding; cheaper tuners need your CPU to do this in software.

Most analogue systems let you capture video from a VCR or camcorder. Look for composite or S-video connectors and stereo phono inputs. Typically, an hour of mpeg-2 video uses up to 2GB of disk space. VHS-quality mpeg-1 gives just over an hour on a CD.

Better TV cards have personal video recorder functionality, letting you pause, fast forward and rewind live TV, and have an electronic programme guide to record shows to your PC.

DIGITAL MUSIC PLAYERS

1

Apple Ipod
£219 ★★★★★
Reviewed January 05, p129
www.apple.com/uk/ipod

Fantastic styling and features that set the standard by which all the others are judged.

2

Apple Ipod Mini
£179 ★★★★☆
Reviewed January 05, p129
www.apple.com/uk/ipod

A great and affordable alternative to the full-sized Ipod, although battery life should be better.

3

Creative Zen Micro
£190 ★★★★☆
Reviewed March 05, p63
http://europe.creative.com

Stylish and well priced, the Zen Micro gives the Ipod Mini some serious competition.

4

Apple Ipod Shuffle
£89 (1GB); £69 (512MB) ★★★★☆
Reviewed May 05, p57
www.apple.com/uk/ipod

Small yet perfectly formed, it's easy to use, has good sound and is set to be a big hit.

5

Iriver H340 SE
£339 ★★★★☆
Reviewed January 05, p130
www.epinx.com

A good all-round player with a colour screen and built-in FM tuner.

HOW TO BUY

The mp3 music format recently celebrated its tenth birthday and in that short space of time it has revolutionised the music industry. On the way, it has spawned a global market for digital music players, none more famous than Apple's Ipod and related offerings.

There are two main categories that players can be divided into: Flash memory-based players, which range in size from 256MB to 1GB and mini hard drive-based models, which run from 4GB to 60GB. Prices for a 256MB player start as low as £20 rising to around £300 for a 60GB player. In terms of songs, the difference is the ability to hold 40 on one and 15,000 on the other. If you just want something for using on-the-move, then Flash-based players are the way to go, since they are very small and light.

The software used in many players determines how easy it is to use in terms of tracklisting and organising songs.

If you need a portable record store, then start by looking at the wide range of 4GB–6GB players and, if that's not enough, head for the 20GB, 40GB and 60GB models. Ensure whatever you buy supports playback in different formats. The ability to listen to FM radio and record voice is also a bonus. Most importantly, check out the battery life, since this can vary wildly between similar devices.

SMARTPHONES

1

Sony Ericsson P910i
£contract dependent ★★★★★
Reviewed December 04, p107
www.sonyericsson.co.uk

The Symbian-powered P9101 has heaps of features and impressed us a great deal.

2

T-Mobile MDA Compact
£contract dependent ★★★★☆
Reviewed July 05, p67
www.t-mobile.co.uk

A good all-in-one tri-band mobile phone and PDA with Bluetooth and an SDIO slot.

3

Sony Ericsson V800
£contract dependent ★★★★☆
Reviewed March 05, p69
www.sonyericsson.co.uk

Light, easy to use and with a great screen, the V800 is a great way to explore the benefits of 3G.

4

Orange SPV C550
£contract dependent ★★★★☆
Reviewed November 05, p48
www.orange.co.uk

A good smartphone, in terms of functionality, but being Windows-based it's annoyingly slow.

5

Blackberry 7100V
£contract dependent ★★★★☆
Reviewed December 04, p105
www.blackberry.com

Great as a portable email tool, but the lack of an SD card slot lets it down.

HOW TO BUY

Smartphones are essentially mobile phones that can do a lot more than send texts and make calls. They are increasingly popular because you get both phone and PDA functions in a single device.

There are two key types of smartphones – those that look roughly like slightly bigger mobile phones and those that are essentially PDAs with voice functionality (Blackberry, Palm, Nokia, etc). We will look primarily at the mobile phone smartphones. They usually boast small colour screens and allow you to send email, access the Internet, run third-party applications, use instant messaging software and sort out your calendar and contacts. Even better, all of this information can be synchronised with your PC or laptop and some even allow you to store and play mp3s, take photos and shoot video.

There are two main operating systems in use: Symbian and Microsoft's Windows Mobile 2003, the latter with a new version due. Symbian controls the lion's share of the market at the moment and its key partner, Nokia, ships over 50 per cent of all smartphones. These smartphones are general-purpose devices and suitable for all the above tasks in moderation.

If you are a heavy email user or plan to work on documents on the move, then consider a PDA-style smartphone with a keypad.

PDAS

1

Dell Axim X50v
£304 ★★★★☆
Reviewed May 05, p57
www.dell.co.uk

A good PDA, with a great VGA-resolution screen, which is perfect for multimedia use.

2

Asus My Pal A730W
£356 ★★★★☆
Reviewed July 05, p69
www.uk.asus.com

A fully-loaded Pocket PC, with a large set of utilities at a reasonable price.

3

Palm Tungsten T5
£279 ★★★★☆
Reviewed March 05, p58
www.palm.com

Another sterling Tungsten upgrade with great new features, let down only by having no Wifi.

4

HP IpaqRX3715 MMC
£224 ★★★★★
Reviewed November 04, p67
www.hp.com/uk

A fantastic Pocket PC with some great features, but the camera's viewfinder could be better.

5

Palmone Zire 72
£169 ★★★★☆
Reviewed August 04, p53
www.palm.com

Provided you don't mind the styling, the Zire 72 is a cheap, yet powerful PDA.

HOW TO BUY

A PDA, or personal digital assistant, is essentially a handheld computer. The PDA market is not as clear cut as it once was, as newer devices with voice capabilities have now arrived. For our purposes, handhelds do not include smartphones.

There are two main types of devices: those that run the Palm operating system and those that run Pocket PC from Microsoft. Both have their advantages, but if you want familiarity, go with a Pocket PC-based device, since it will run versions of common Microsoft applications.

If you plan to write a lot, consider a model with a keyboard. Otherwise, go for a pen-based device which is typically half the price and offers an on-screen keyboard or has handwriting recognition features.

Most PDAs use memory for storage, so look for a device with 64MB or more, if possible. Storage can be boosted using flash memory cards in the SD card slot. Newer devices now have tiny hard disk drives with capacities of up to 4GB.

Most PDAs come with colour screens for viewing photos and media files. If watching video is a priority, go for one with the highest screen resolution. For the best in connectivity, opt for a model with in-built Bluetooth and wireless networking or Wifi technology. ↘

PORTABLE MEDIA PLAYERS

1

Archos AV400
£314.99 ★★★★★
Reviewed June 05, p56
www.datamind.co.uk

A great alternative to Microsoft-based models, offering more features than the competition.

2

Archos Gmini 400
£239.99 ★★★★★
Reviewed June 05, p56
www.datamind.co.uk

A scaled-down version of the AV400, it's portable, with great battery life and an array of features.

3

Digital Cube I-Station
£329.99 ★★★★☆
Reviewed July 05, p68
www.datamind.co.uk

A 20GB model with an FM tuner and mp3 recorder, it also supports a wide range of video formats.

4

Hauppauge PVMP
£399 ★★★★☆
Reviewed June 05, p56
www.hauppauge.co.uk

The PVMP offers a large 7in widescreen display, perfect for watching movies.

5

MSI Megaview 566
£250 ★★★★☆
Reviewed June 05, p56
http://msicomputer.co.uk

A lightweight media player that will happily record from a video source.

HOW TO BUY

Portable media players (PMPs), also called personal video players (PVPs), are the big brothers of mp3 players with video capabilities thrown in. You may also come across the term Personal Media Center (PMC), which are players built around Microsoft's Windows Mobile operating system.

PMPs, like many larger mp3 players, are based on mini hard disk drive technology and usually start at around 20GB. They allow you to watch movies, view photos and play music files. A good model will support mpeg-2 and 4, wmv and DivX movie formats, as well as mp3, wav asf and wma audio files. Some can also receive and record FM radio and voice.

They come in a variety of sizes, with screens ranging from just over 2in to around 4in. The most common screen size is around 2.5–3in. Thanks largely to the screen and the mini hard drives, PMPs weigh a bit more than, say, an Ipod, but at 150–300g they're not going to be too heavy to carry around. Many of the features on these devices are similar, from screen size to hard disks and supported formats. What sets them apart is weight, screen resolution, movie playback quality and battery life.

Test them out, if possible, or check out the PCW reviews before splashing out.

PERSONAL VIDEO RECORDERS

1

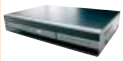
Plextor ConverTX PVR
£151.56 ★★★★☆
Reviewed June 05, p62
www.plextor.be

The ConverTX is an external analogue tuner that can also record from most video sources.

2

Twinhan Magic Box
£69.99 ★★★★☆
Reviewed August 05, p59
www.twinhan.com

Another PC-based stylish external USB2 tuner with good software and an attractive price.

3 

Kiss DP-558
£293.75 ★★★☆☆
Reviewed October 05, p44
www.kiss-technology.com

A networkable PVR that lets you play Internet radio, although it has only got an analogue tuner.

4

Mustek DVD R580
£244.87 ★★★☆☆
Reviewed September 05, p71
www.mustek.com

Lots of features and connectivity options in this combo DVD recorder/hard disk standalone PVR.

5

Pinnacle Mediacenter 300i
£79.99 ★★★☆☆
Reviewed March 05, p59
www.pinnaclesys.com

The 300i is good value for money if you want to turn your PC into a PVR.

HOW TO BUY

The personal video recorder (PVR), also known as a digital video recorder (DVR), is a device that records TV onto an internal hard drive in digital format. Unlike video and DVD recorders, there is no need for tapes or disks.

Tivo launched the world's first PVR in 1999 and most PVRs use the mpeg format for encoding video. Unlike VHS recorders, PVRs give you the ability to pause live TV, instantly replay scenes just watched while continuing to record and, most importantly, skip through adverts.

In the UK, Sky+ PVRs dominate the market, with other players, including Tivo and Telewest, trailing a long way behind.

The first thing to consider when buying a PVR is the size of the hard drive. Try going for one with a minimum of 40GB, but 80GB would be better. Most will come with a single Freeview tuner for getting free digital TV signals, but an increasing number are arriving with two. This means you can watch one channel and record another or even record two different channels while watching a previous recording.

At the heart of any PVR is the electronic programme guide (EPG). It's needed for selecting all the things you want your PVR to record. The better the EPG, the more intuitive your PVR becomes, recording programmes by itself based on your previous choices.

Got a product or service you want to sell? Place it here.

97% of readers refer to our product reviews.

95% use our best buy listings for purchasing advice.

Source: PCW readership survey 2005

To advertise here call Paul Harvey on 020 7316 9465
or email on paul_harvey@vnu.co.uk

BACKUP SOFTWARE

1 **Roxio Backup My PC Deluxe 6**
£34.99 ★★★★★
Reviewed June 05, p82
www.roxio.co.uk
Takes the mystery out of backups and is ideal as a simple solution to protect PC files.

2 **Acronis True Image 8**
£29.99 ★★★★★
Reviewed February 05, p82
www.phoenixglobalsoftware.co.uk
This easy-to-use disk imaging package should be part of every PC owner's toolkit.

3 **X Drive**
$99.50 per year for 5GB ★★★★☆
Reviewed October 05, p107
www.xdrive.com
A flexible, simple-to-use and attractively priced online backup service.

HOW TO BUY

Backing up important data is something a lot of home users, and homeworkers, fail to take seriously. Until, of course, they lose everything and have no way of getting it back. In order to avoid such a calamitous event, consider some form of backup solution now.

Most of the leading backup packages cost between £30 and £50. A good solution will allow you to do full hard disk backups, as well as single files and folders, plus let you schedule backups of data that's changed since the last full backup was executed. They should be easy to install and set up.

Backups should be easy to restore and retain the original file organisation. Any solution should be able to write backups to your hard drive, external hard drives and blank CD/DVD discs.

DIGITAL IMAGE-EDITING SOFTWARE

1 **Adobe Photoshop Elements 3**
£69.33 ★★★★★
Reviewed January 05, p83
www.adobe.co.uk
By far the best budget-priced image editor, and a must-have upgrade.

2 **Adobe Photoshop CS2**
£538 ★★★★☆
Reviewed June 05, p76
www.adobe.co.uk
Still the undisputed leader for professional photo editing, but its high price will put most off.

3 **Corel Paintshop Pro 9**
£99.99 ★★★★☆
Reviewed December 04, p75
www.corel.co.uk
A great product with a wealth of features, it's a decent alternative to Photoshop for average users.

HOW TO BUY

Many digital cameras come bundled with some form of basic photo-editing software, but to move on to the next level you really need to start using a dedicated editing package.

For good mid-range programs, prices range from free for open-source programs such as Gimp, up to about £90.

Look out for features including advanced colour correction, lighting controls, automatic photo-fix wizards, scratch and blemish remover, multiple undo options, special effects, layers and templates. The software should also let you create slideshows, publish to the web, save in many different formats and archive images to CD/DVD discs.

Most importantly, there should be extensive help files, FAQs, tutorials, web forums, email and phone support.

MEDIA CREATION SOFTWARE

1 **Roxio Easy Media Creator 7.5**
£69.99 ★★★★★
Reviewed July 05, p72
www.roxio.co.uk
Excellent value, especially for first-time users in need of a complete suite of digital media tools.

2 **Pinnacle Studio Media Suite**
£89.99 ★★★★☆
Reviewed March 05, p76
www.pinnaclesys.com
A massive amount of software for your money, including an excellent video editor.

3 **Roxio MyDVD and Slideshow**
£29.99 ★★★★☆
Reviewed May 05, p76
www.roxio.co.uk
Great for home users who want to burn impressive-looking videos and slideshows to DVD.

HOW TO BUY

This is the software you need for burning CDs and DVDs. Most new PCs and DVD burners come bundled with some kind of media creation software. A good product will allow you to burn audio and video content onto CDs and DVDs, back up data, create electronic photo albums, and make your own DVD menus and labels.

Bundled versions are usually limited, or 'lite', versions of leading brands such as Nero, Roxio Easy Media Creator, Intervideo WinDVD or Pinnacle CD/DVD Creator, among others. You can usually upgrade to the full version online and save about 20 per cent or more on what you would pay for a standalone version.

Prices for standalone media creation software start at £20 for basic CD/DVD authoring software and rise to around £60 for the most advanced suites.

PC MAINTENANCE/UTILITY SOFTWARE

1 **Orlogix Wincleaner Complete PC Care**
£34.99 ★★★★☆
Reviewed July 05, p76
www.orlogix.com
If your system is running slower than it should, this package will help restore its performance.

2 **Allume BoostXP**
£19.99 ★★★☆☆
Reviewed May 05, 82
www.allume.com
BoostXP makes tweaking your system much easier than doing it manually.

3 **System Mechanic 5 Professional**
£49.95 ★★★☆☆
Reviewed April 05, p82
www.itred.com
As well as performing PC maintenance, this product includes firewall and anti-virus software.

HOW TO BUY

Just like your car, PCs need regular maintenance to keep them in good working order. There are tools within Windows that can help, but a dedicated suite of maintenance or utility software should do a better job.

Utility software often comes with a virus scanner, but you may already have one, so concentrate on one with the following features. It should offer a simple overview of system and application performance, the ability to clean out the Registry and restore it easily if any mistakes occur, defragment the hard disk drive and memory, and optimise application performance. It should have some form of reporting and let you simplify the control of key Windows settings.

Other common tools will back up data, recover deleted files and speed up your Internet surfing. ↘

PC SECURITY SOFTWARE

1 **Bitdefender 8 Professional Plus**
£39.99 ★★★★☆
Reviewed August 05, p79
www.bitdefender.com
An easy-to-use suite that includes two years of free updates and 24/7 live online support.

2 **F-Secure Internet Security 2005**
£38.95 ★★★★☆
Reviewed June 05, p81
www.f-secure.co.uk
A well-priced, professional product that provides good all-round protection.

3 **Zone Labs Zone Alarm Security Suite 6**
£49.95 ★★★★☆
Reviewed November 05, p61
www.zonelabs.com
A comprehensive product that offers excellent Internet security, including spam filtering.

HOW TO BUY

You cannot own a PC or laptop today without taking adequate security measures. The Internet may have opened up many opportunities, but it is also a dangerous place for an unprotected PC. In order to cover yourself, both online and offline, you will need a decent security software suite which combines numerous utilities to tackle different threats.

Popular brands include those from Zone Labs, Trend Micro, Norton and McAfee.

A good security suite should include a firewall, email scanner, spyware checker, anti-virus and anti-spam tools.

Prices for some of the best tools start at around £35 and usually include a year's online updates. After a year you will need to pay a yearly subscription to keep your software up to date.

OFFICE SOFTWARE

1 **Microsoft Office Professional 2003**
£459 ★★★★☆
Reviewed May 04, p150
www.microsoft.com/uk/office
Sets the standard for office suites for those prepared to pay the price.

2 **Openoffice.org 2**
Free ★★★☆☆
Reviewed July 05, p78
www.openoffice.org
New features and improved compatibility make this a genuine alternative to Microsoft Office.

3 **Ability Office 4**
£49.95 ★★★★☆
Reviewed June 04, p66
www.uk.ability.com
A great suite that offers an awful lot of functionality for a very low price.

HOW TO BUY

Office software generally refers to word processors, spreadsheets, presentation software and email utilities. Microsoft Office dominates this arena. But most new PCs come bundled with Microsoft Works Suite 2005, which has Word, Works Database, Spreadsheet and a range of home packages.

To upgrade to a full version of Microsoft Office will cost around £150. Many will not need the functionality of Office though, and the Outlook Express email software shipped with all Windows PCs is enough for most users. If you can wait, then do so, since Microsoft plans to launch Office 12 in July 2006. But don't forget the competition either: products such as Ability Office, Star Office and the free open-source version, Open Office, are available.

VIDEO-EDITING SOFTWARE

1 **Adobe Premiere Elements**
£69.32 ★★★★☆
Reviewed January 05, p148
www.adobe.co.uk
Hassle-free capture and good effects, it's an impressive product offering a lot to video makers.

2 **Ulead Videostudio 9**
£49.99 ★★★★☆
Reviewed September 05, p78
www.ulead.co.uk
Simple yet thorough, Videostudio offers plenty, whatever your level of expertise.

3 **Serif Movieplus 4**
£59.99 ★★★★☆
Reviewed August 05, p76
www.serif.com
Powerful features at an attractive price for budding film editors, but needs more help for novices.

HOW TO BUY

This is a must for anyone hoping to turn hours of camcorder footage into tightly edited, watchable movies. There are a lot of packages to choose from, but new tools geared towards the novice are popping up in all of them. Not only are they making it easy to get your movies onto DVD, but a wider range of tools allow you to personalise what you've shot.

Basic packages cover capture, storyboarding, timeline video editing and template-based DVD authoring. More advanced software will let you create a wide range of special effects and are aimed at the home movie enthusiast. Prices start at around £40, but it's important to find a package with good help files – video-editing software often assumes a lot of prior knowledge.

Over 250,000 technology consumers will look HERE in the next 30 days.

Call Paul Harvey on 020 7316 9465 to advertise here.

PRODUCT INDEX

Below is a list of every product reviewed by PCW over the past three months, to help you find the full reviews quickly and easily in your back issues.

Key: ★ Editor's Choice; ★ Recommended/Highly Commended. All scores are out of five

	COMPANY	PRODUCT	ISSUE	SCORE
	2K Games	Close Combat: First to Fight	Aug 05	4
	3Com	Office Connect Wireless Router	Aug 05	3
	A4tech	NB-30 battery-free mouse	Aug 05	4
	Abit	Fatal1ty AN8	Aug 05	4
★	Acer	AL1922HS	Sep 05	5
★	Acer	Aspire 3022	Oct 05	5
	Acer	Ferrari 4005WLMi	Oct 05	3
	Acer	Travelmate 3000	Aug 05	3
★	Adept Scientific	ACD Systems Canvas X	Sep 05	4
	Advent	T9504	Aug 05	4
	AJP	AJP 532	Oct 05	3
★	Akasa	Amber Series Quiet Fans	Oct 05	5
★	Akasa	Eclipse-62	Oct 05	5
	Akasa	Powerplus 550W	Oct 05	4
★	Antec	Truepower 2 480W	Aug 05	4
	Antec	V-Cool	Oct 05	4
★	Aopen	Aeolus 7800GTX	Oct 05	4
	Aopen	Aeolus PCX6800 DVD256	Sep 05	4
	Aopen	MZ855-II	Sep 05	4
★	APC	Biometric Password Kit	Oct 05	4
	Apple	.Mac	Oct 05	3
★	Apple	Mac OS 10.4	Aug 05	4
	Asus	EN7800GTX	Oct 05	3
	Asus	P5LD2 Deluxe/EU-P3	Oct 05	4
	Asus	Vento 3600	Aug 05	3
	Audiotrieve	Inboxer	Oct 05	2
	Avermedia	AverTV DVB-T USB2	Aug 05	4
	AVG	7 Plus Firewall	Oct 05	4
	Backup Direct	Backup Direct	Oct 05	3
	Backup My Stuff	Backup My Stuff	Oct 05	3
	Belinea	10 19 20	Sep 05	4
	Belkin	Pre-N Wireless Networking	Sep 05	4
	Benq	FP937s	Sep 05	3
	BHV	Easy Wireless	Oct 05	2
	Black Bean Games	S.C.A.R.	Sep 05	4
	Bonusprint	Bonusprint	Sep 05	3
	Buffalo	Airstation Mimo	Sep 05	4
	Buffalo	Wireless Gateway	Sep 05	4
	Canon	Image Gateway	Sep 05	3
	Canon	Ixus 50	Aug 05	4
★	Canon	Ixus i5	Aug 05	4
	Canon	LBP-5200	Oct 05	4
★	Canon	MV850i	Sep 05	4
★	Canon	Selphy CP600	Sep 05	5
★	Carrera	Ultimate 64 PCW-09	Sep 05	4
★	Casio	Exilim Zoom EX-Z57	Aug 05	4
	CCA Software	Lottery Cracker AE	Sep 05	1
	Chillblast	Fusion FX55 SLI	Aug 05	4
	Cloudmark	4.3 for Outlook	Oct 05	3
	Computers Unltd	Bryce 5.5	Aug 05	4
	Contentwatch	Email Protect 1.8	Oct 05	3
★	CTX	S966A	Sep 05	4
	Cube24/7	Taurus	Oct 05	3
	Cyberpatrol	Cyberpatrol	Aug 05	4
	Deep Silver	Earth 2160	Oct 05	4
	Deep Silver	Singles: Triple Trouble	Sep 05	3
★	Dell	1600n	Sep 05	4
	Dell	Inspiron XPS	Sep 05	3
	Demonite	Ultimate SLI Pro	Aug 05	3
	Destinator	Destinator PN	Oct 05	3
	Dialogue	Flybook	Sep 05	3
	Digital Jesters	Freedom Force vs 3rd Reich	Aug 05	4
	Digital Jesters	Trackmania: Sunrise	Aug 05	4
	D-Link	DCS-2100G	Sep 05	3
	D-Link	DSL-G604T	Aug 05	3
	Draytek	Vigor 2600G	Aug 05	4
	ECS	PF88 Extreme	Aug 05	4
	Editions-Profil	Bitdefender 8 Pro Plus	Aug 05	4
★	Electronic Arts	Battlefield 2	Oct 05	5
	Electronic Arts	Cricket 2005	Oct 05	3
	Elonex	Lumina	Oct 05	3
	Epson	Stylus Photo R1800	Sep 05	4
	Evesham	Axis SB	Sep 05	3
	Evesham	Decimator 78FX	Oct 05	4
★	Evesham	Evolution Decimator	Aug 05	5
★	Evesham	Quest Roma	Sep 05	4
★	Evesham	Quest T28	Oct 05	4
	Firetrust	Mailwasher Pro	Oct 05	2
	Flickr	Flickr	Sep 05	4
	Focus Multimedia	Infinite Sudoku	Oct 05	4
★	Fotango	Fotango	Sep 05	5
	Freecom	Mediaplayer-3	Oct 05	4
	FSP	Green Power 400W PSU	Sep 05	3
	Fujifilm	FDIprint	Sep 05	1
	Fujifilm	Finepix F10 Zoom	Aug 05	4
	Fujitsu-Siemens	P20-2	Aug 05	3
★	Fujitsu-Siemens	Scansnap II Plus	Aug 05	5
★	Gainward	Ultra/350PCX	Oct 05	4
	Galaxy	Geforce 7800GTX	Oct 05	4
	Gigabyte	3D Aurora	Oct 05	4
	Gigabyte	GA-8N-SLI Royal	Oct 05	4
	Gigabyte	G-Power Pro	Sep 05	4
	Gigabyte	GV-NX78X256V-B	Oct 05	4
★	Gigabyte	NV78X256V-B	Sep 05	4
	Google	Picasa	Sep 05	4
	Guildsoft	Photo Explosion Deluxe 2	Aug 05	3
	Hauppauge	DEC-2000T	Aug 05	3
	HP	Laserjet 1020	Aug 05	4
	HP	Pavilion ZE2001EA	Oct 05	3
	HP	Snapfish/Truprint	Sep 05	2
	High Mountain	Spameater Pro	Oct 05	3
	Iiyama	Prolite E481s	Oct 05	3
	Infoanyplace	Infoanyplace	Sep 05	3
	Intellect	Prodesk A64/3000+	Sep 05	3
	Internity	I-Tech Bluetooth VKB	Oct 05	3
	Ipswitch	WS-FTP Pro 2006	Oct 05	4
	Iris	Readiris Pro 10	Sep 05	4
★	Jal	Adhira	Aug 05	4
★	Jal	Serena+	Sep 05	3
★	Jessops	Photo Express	Sep 05	4
	JVC	GR-DF420	Sep 05	4
	Kiss	DP-558	Oct 05	3
	Koch Media	Allume Stuffit 9 Deluxe	Aug 05	3
★	Kodak	Easyshare Gallery	Sep 05	4
	Kodak	Easyshare LS753	Aug 05	3
	Kodak/T-Mobile	T-Mobile Kodak Mobile	Sep 05	4
	Lenovo	Thinkpad T43P	Oct 05	4
	Lexmark	P4350	Oct 05	4
★	LG	Flatron L2013P	Oct 05	4
	LG	L1950	Sep 05	3
	Lifestyle	Lifethemes	Aug 05	3
	Lilliput	629GL-70NP/C/T	Oct 05	4
★	Linksys	WAG54G	Aug 05	5
★	Linksys	Wireless G SRX	Sep 05	5
	Mailfrontier	Desktop 4.5	Oct 05	2
★	Mandriva	Linux LE 2005	Sep 05	4
★	Maxivista	2 Professional	Sep 05	5
★	McAfee	Internet Security 2005	Oct 05	4
★	Mesh	Elite Extreme PBX	Aug 05	5
★	Mesh	Matrix Eclipse PCW	Sep 05	5
★	Mesh	Matrix Titan FX57 GTX	Sep 05	5
	Mesh	Pegasus 15in PCW	Oct 05	4
★	Mesh	Pegasus 3700+	Aug 05	4
★	Mesh	Titan Dual X2 Pro	Aug 05	5
★	Metaboli	Metaboli	Oct 05	4
★	Microsoft	Student 2006	Oct 05	5
	Microsoft	Windows XP Pro x64 Edition	Aug 05	4
	Microsoft	Wireless Intellimouse Explorer	Oct 05	3
	Motion Computing	LE1600	Oct 05	4
	Motion Computing	LE1600	Sep 05	4
	MSI	NX7800GTX	Oct 05	3
	Mustek	DVD R580	Sep 05	3
★	MV	Mobeus 1.4 Celeron	Oct 05	5
	Navicore	Personal	Oct 05	3
★	Nebula	DigiTV	Aug 05	5
★	NEC	LCD2070NX	Sep 05	5
	NEC	Multisync LCD1970NX	Sep 05	4
	Neovo	M-19	Sep 05	3
	Net Intact	Packetlogic PL2	Sep 05	3
★	Netbax	Netbax	Oct 05	4
★	Netgear	Prosafe FS108P	Sep 05	4
	Netgear	Rangemax	Sep 05	4
	Netgear	TA612V	Oct 05	2
★	Netgear	WGT634U	Aug 05	4
★	Nethighstreet	Net PCW 799	Sep 05	4
★	Nexon	NAS1000	Sep 05	4
★	Nikon	Coolpix S1	Aug 05	5
	Novatech	Nexus Damptek Block Kit	Aug 05	4
	Novatech	Nexus H20-2000 Water Block	Aug 05	3
	Novell	Suse Linux Pro 9.3 64bit	Aug 05	4
	O&O	Defrag 8 Professional	Sep 05	4
	Olympus	Mju-Mini S	Aug 05	3
	Orlogix	Gamedrive 9	Oct 05	4
	Ovislink	WMU-9000VPN	Aug 05	2
★	Packeteer	Packet Shaper 6500	Sep 05	4
	Panasonic	BL-C30	Sep 05	4
	Panasonic	NV-GS21	Sep 05	3
	PC Fort	PC Fort	Oct 05	3
	Pentax	Optio S5n	Aug 05	4
	Peribit	SR-50 Sequence Reducer	Sep 05	4
	Philips	Brilliance 190P6	Sep 05	4
	Philips	DVDR16LSK	Oct 05	4
	Philips	Shoqbox	Aug 05	4
	Photobox	Photobox	Sep 05	3
	Pinnacle	Showcenter 200	Sep 05	3
	Pixum	Pixum	Sep 05	4
	Plantronics	CS60-USB	Aug 05	4
	Podgear	Shuffle Station	Sep 05	4
	Powercolor	X800 256MB Game FX	Aug 05	4
	Quiet PC	Acoustifan AFDP-8025B	Sep 05	4
	Quiet PC	Acoustifeet 3007 Case Feet	Sep 05	4
	Qurb	Qurb 2	Oct 05	2
	Robin Kier	K9 Antispam 1.28	Oct 05	3
★	Rockstar	Grand Theft Auto: San Andreas	Sep 05	5
	Romsey	PDAlok	Oct 05	3
★	Samsung	Syncmaster 913N	Sep 05	4
	Samsung	VP-D453	Sep 05	3
	Sapphire	Radeon X800XL Ultimate	Aug 05	4
	Sapphire	Radeon X850XT Platinum (AGP)	Sep 05	4
★	Scansoft	PDF Converter 3 Pro	Sep 05	4
	Scythe	Ninja	Oct 05	4
	Scythe	Samurai RevB	Aug 05	4
	Secured Backup	Secured Backup	Oct 05	2
	Selwyn Electronics	Acecad Digimemo	Aug 05	3
	Sennheiser	RS 130	Oct 05	4
	Serif	Movieplus 4	Aug 05	4
	Sharp	LL-193A-B	Sep 05	3
	SMC	Barricade 7204BRA	Aug 05	3
	SMC	Barricade 7804WBRA	Aug 05	3
	Sonos	Digital Music System	Oct 05	4
★	Sony	DCR-HC19E	Sep 05	4
	Sony	Microvault 256MB	Oct 05	3
	Sony	SDM-HS95	Sep 05	3
	Sony	Cybershot DSC-T33	Aug 05	3
★	Sourceforge	Spambayes 1.0.1	Oct 05	4
	Spycleaner	Gold 9.3	Aug 05	2
	Storegate	Private Plus	Oct 05	3
	Streamload	Streamload	Oct 05	2
	Symantec	Norton Internet Security 2005	Oct 05	3
★	Symbiant	Easygen 2.2	Oct 05	5
	Symbol	MC50	Oct 05	4
	Thomson	Speedtouch 510	Aug 05	3
	Thomson	Speedtouch 580	Aug 05	3
	Tiger Telematics	Gizmondo	Aug 05	4
	Toshiba	MK1032 GAX	Aug 05	5
★	Toshiba	Portégé M300	Sep 05	4
	Toshiba	Satellite L10 114	Oct 05	3
	Toshiba	SD-R6472 DVD Writer	Sep 05	4
	Twinhan	Magic Box	Aug 05	4
★	Ulead	Videostudio 9	Sep 05	4
	US Robotics	MaxG Router	Oct 05	4
★	US Robotics	Sure Connect 9105	Aug 05	4
	Viewsonic	PJ400	Aug 05	4
	Viewsonic	VX912	Sep 05	3
	Wacom	Volito2 pen tablet	Oct 05	3
	Watford	Aries Performa 7211	Sep 05	3
	Watford	Aries Titanium 6851	Aug 05	3
	Watford	Provision 2001	Oct 05	3
	WM Recorder	WM Recorder	Sep 05	4
★	X Drive	X Drive	Oct 05	4
	XFX	Geforce 6800 GT	Sep 05	4
	XFX	Geforce 7800GTX	Oct 05	3
	Zalman	Reserator 1 Plus	Oct 05	4
	Zoom	ADSL 5565 X5v	Aug 05	3
	Zyxel	Prestige 2602HW	Oct 05	3
	Zyxel	Prestige 662HW-61	Aug 05	4
	Zyxel	Zywall P1	Oct 05	3

power computing ltd

EST. 1984

opening hours
mon - fri 9 - 6pm
sat 10 - 4pm
sun closed

All prices include VAT. **t 01234 851500**

Sale Sale Sale!

2 YEARS RTB PARTS & LABOUR WARRANTY
FREE COLLECT & RETURN ON ALL SYSTEMS

Power Cracker
2600+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- AMD Sempron 2600+
- 256MB DDR 3200
- 5.1 On-Board Sound Card
- 40GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- 52x CD Rom Drive
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

Change CDROM to CDRW for only £10.00 Extra!
Or CDROM to DVDRW16x +/- for only £40.00 Extra!

WAS ~~£219.95~~
Save £30!
NOW **£189.95**

Power Evo
3000+ 64bit DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket 754 M/Board
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 6x Rear USB 2.0 2x SATA RAID 0,1,
- AMD Sempron 3000+ 64bit
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- ASUS 52x32x52 CDRW 16x DVD
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

Change CDRW/DVD Combo Drive to DVDRW16x +/- for only £20.00 Extra!

WAS ~~£279.95~~
Save £30!
NOW **£249.95** Inc VAT

Power Predator 64bit
3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN K8S760 M/Board
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- 1x FireWire Port 2x SATA RAID 0,1
- AMD 3000+ 64Bit Skt. 754
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

WAS ~~£359.95~~
Save £40!
NOW **£319.95** Inc VAT

Power AMD64
3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- ASUS A8V-E DELUXE M/Board
- 1xPCI Express x16, 3xPCI, 2x PCI Express x1
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 2x SATA RAID 0,1
- AMD 3000+ 64Bit Skt. 939
- 512MB DDR 3200
- 8 Channel On-Board Sound Card
- 120GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS 6200 NvidiaTurbo Cache Graphics Card Supports 256MB
- Integrated GB Ethernet Card
- 2 Years Parts & Labour Warranty Free Collect & Return

WAS ~~£449.95~~
Save £50!
NOW **£399.95** Inc VAT

STAR BUY!

Power Stopper
2600+ DDR PC

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
- 2x Front USB 2.0
- AMD Sempron 2600+
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- Logitech Internet Pro Keyboard
- Logitech Optical Wheel Mouse
- 1.44MB Floppy Disk Drive
- ASUS 52x32x52 CDRW 16x DVD
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- Windows XP Home Inc. CD & Licence
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

Add a 15" TFT for £119.95

Change CDRW/DVD Combo Drive to DVDRW16x +/- for only £20.00 Extra!

WAS ~~£349.95~~
Save £50!
NOW **£299.95** Inc VAT

Power Xtra Black
3000+ 64bit DDR PC

- ATX Midi Tower Case Black 400Watt PSU
- FOXCONN Socket 754 M/Board 400FSB
- 1xAGPx8 3xPCI 4x 1x Parallel
- 2x Front USB 2.0 Rear USB 2.0 2x SATA RAID 0,1,
- AMD Sempron 3000+ 64bit
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 120GB 7200RPM Hard Drive
- **17" TFT 16m/s Silver & Black Flat Panel Monitor Inc. Speakers**
- Logitech Internet Pro Keyboard
- Logitech Optical Wheel Mouse
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS V9520-X Nvidia FX5200 3D Graphics
- Integrated 10/100 Ethernet Card
- 56.6k Internal Dial Up Modem
- Windows XP Home Inc. CD & Licence
- Microsoft Works 8
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

Complete System

WAS ~~£609.95~~
Save £50!
NOW **£559.95** Inc VAT

Millennium Black 64bit
3000+ DDR PC

- ATX Midi Tower Case Black 400Watt PSU
- ASUS A8V-E DELUXE M/Board
- 1xPCI Express x16, 2x PCI Express x1, 3xPCI
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 2x SATA RAID 0,1
- AMD 64Bit 3000+ Skt 939
- 1GB DDR 3200
- 8 Channel On-Board Sound Card
- 120GB 7200RPM Hard Drive
- **19" TFT 16m/s Silver & Black Flat Panel Monitor Inc. Speakers**
- Logitech Internet Pro Wireless Keyboard & Mouse
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS 6200 NvidiaTurbo Cache Graphics Card Supports 256MB
- Integrated GB Ethernet Card
- 56.6k Internal Dial Up Modem
- Windows XP Home Inc. CD & Licence
- Microsoft Works Suite 2005 Inc. Word, Works,Encarta,Photo Standard, AutoRoute
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

Complete System

WAS ~~£899.95~~
Save £100!
NOW **£799.95** Inc VAT

Power Extreme SLI
3500+ DDR PC

- ATX Midi Tower Case Black
- Hiper Type-R 480Watt PSU
- ASUS A8N-SLI Deluxe M/Board M/Board
- 2xPCI Express x16, 3xPCI, 2x PCI Express x1
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 4x SATA RAID 0,1,5
- AMD 64Bit 3500+ Skt 939
- 2GB DDR 3200
- 8 Channel On-Board Sound Card
- 200GB SATA 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- 2x ASUS Extreme 6600GT Graphics Card In SLI Mode
- 2xIntegrated GB Ethernet Card
- Windows XP Home Inc. CD & Licence
- Anti Virus Software
- 2 Years Parts & Labour Warranty Free Collect & Return

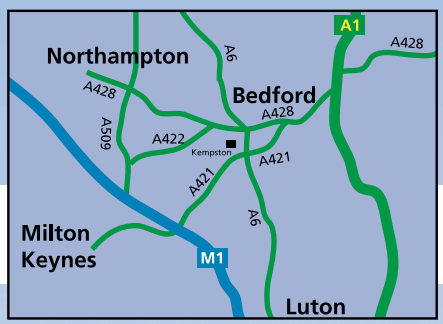
WAS ~~£1050.95~~
Save £50!
NOW **£999.95** Inc VAT

We Custom Build PC's to your specification - please call

WOW!

FREE UK MAINLAND DELIVERY on all ON-LINE ORDERS when you spend £50.00 or more

No Surcharge on Credit Cards!



www.powerc.com

Memory Madness!

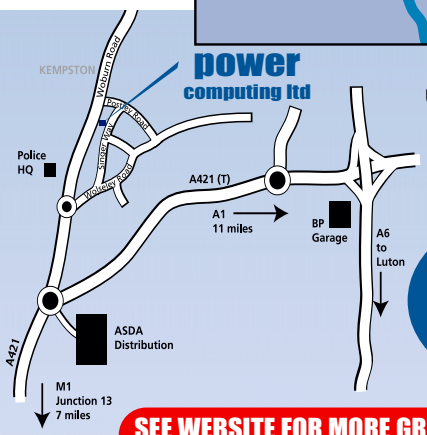
WHILE STOCKS LAST!

DDR2 now available, please call

256MB PC2700 DDR 184PIN 333 mhz	WOW PRICE! £19.95	256MB PC3200 DDR 184PIN 400 mhz	WOW PRICE! £19.95
512MB PC2700 DDR 184PIN 333 mhz	WOW PRICE! £39.95	512MB PC3200 DDR 184PIN 400 mhz	WOW PRICE! £39.95

Memory Pens

128MB USB2.0 Memory Pen. £11.95
256MB USB2.0 Memory Pen. £19.95
512MB USB2.0 Memory Pen. £34.95
1GB USB2.0 Memory Pen. £59.95
2GB USB2.0 Memory Pen. £119.95



power computing ltd

unit 82a , singer way
woburn rd ind. est.,
kempston
bedford mk42 7pu

We Custom build Laptops! Call for details

SEE WEBSITE FOR MORE GREAT OFFERS!
www.powerc.com

Laptops from £499.95

LG DVD/RW16x+/- only £39.95 ! Nero 6 inc.

17" TFT Monitor Silver Inc. Speakers8MS Response Time only £169.95 !

Maxtor 80GB 7200 HD only £39.95 !

Wow! Upgrade your PC for Less!

All prices include VAT.

Hard Drive Upgrades

Maxtor 40GB 7200RPM IDE £33.95
Maxtor 80GB 7200RPM IDE £39.95
Maxtor 120GB 7200RPM IDE £54.95
Maxtor 120GB 7200RPM IDE (8MB Cache) £59.95
Maxtor 160GB 7200RPM IDE (8MB Cache) £64.95
Maxtor 200GB 7200RPM IDE (8MB Cache) £74.95
Maxtor 250GB 7200RPM IDE (16MB Cache) £94.95
Maxtor 300GB 7200RPM IDE (16mb Cache) £124.95
Maxtor 120GB 7200RPM SATA (8MB Cache) £64.95
Maxtor 200GB 7200RPM SATA (8MB Cache) £79.95
Maxtor 250GB 7200RPM SATA (16MB Cache) £104.95
Maxtor 300GB 7200RPM SATA (16mb Cache) £134.95
Removable HardDrive Caddy/Bay IDE £19.95
External Hard Drive Case USB2.0/Firewire £39.95
IDE Rounded Hard Drive /CD Cable £5.95

Monitors All Have 3 Years On-Site Warranty

17" CRT Monitor £69.95
19" CRT Monitor £119.95
15" TFT SILVER/BLACK 16m/s £119.95
17" TFT SILVER/BLACK 8m/s £169.95
19" TFT BELINEA 101902 16m/s £229.95

Modems & Network

56.6k V92 Internal PCI Modem (Rockwell Chipset) £9.95
56.6K V90 External USB Modem £29.95
10/100 RJ45 PCI Network Card £9.95
5 Port Switch Hub. £24.95
8 Port Switch Hub. £29.95
Netgear WG602 Wireless Access Point £59.95
Netgear WGE111 54G Wireless Game Adapter £49.95
Netgear DG632 ADSL Modem USB Router 1x Lan 10/100 .....£49.95
Netgear DG834 ADSL Modem Router 4x Lan 10/100 .....£59.95
Netgear DG834G Wireless ADSL 54G Router 4x Lan 10/100 .....£69.95
Netgear DG834GT Wireless ADSL 108G Router 4x Lan 10/100 .....£99.95
Netgear RP614 DSL Router 4x Lan 10/100 .....£39.95
Netgear WGR614 Wireless DSL 54G Router 4x Lan 10/100 .....£59.95
Netgear WGT624 Wireless DSL 108G Router 4x Lan 10/100 .....£79.95
Netgear WG111TGE USB 2.0 Wireless 108G £49.95
Netgear WG311T PCI Wireless 108G £49.95
ASUS PCI Wireless 54G. £24.95
ASUS USB 2.0 Wireless 54G. £24.95

Ports

USB 2.0 4 Port Internal PCI £14.95
PCI I/O Ports 2x Serial 1x Parallel £19.95
Firewire & USB 2 Combo Card Inc.Firewire Cable & Software. £29.95
USB Bluetooth Dongle Upto 100Metre £29.95
USB Serial/Parallel Convertor £29.95
USB Smart Card Reader 15 in 1 External. £14.95

CDROM\CDRW\DVD Drives (Retail Boxed)

ASUS DVD-E616 16x DVD (Beige or Black) £19.95
ASUS 52x32x52 CDRW,Nero Quiet £19.95
ASUS CDRW\DVD Combo 52x32x52 16xDVD. £29.95
ASUS 52x24x52 External £49.95
LG Dual Layer 16x-/+ DVD RW + RAM (Beige or Black) £39.95

Cases

ATX Midi Tower Case with Front USB 400 Watt £39.95
350 watt PSU £24.95
XPro 400 watt true power £49.95
Hiper Type-R 480 watt black true power £59.95

Graphics Cards AGP

ASUS NVIDIA V9520-X FX 5200 128MB AGPx8 .....£34.95
ASUS NVIDIA N6200GE 128MB AGPx8 .....£79.95
ASUS NVIDIA 6600 256MB AGPx8 .....£104.95
ASUS NVIDIA 6600GT 128MB AGPx8 .....£134.95
ASUS NVIDIA 6800GT 128MB AGPx8 .....£229.95
ASUS ATI 9250 256MB AGPx8 .....£44.95
POWER COLOR ATI 9800 PRO AGPx8 .....£109.95
POWER COLOR ATI 9800SE All In Wonder Inc.TV Tuner & Remote 128MB AGPx8 .....£119.95

Graphics Cards PCI Express 16

ASUS NVIDIA EN6200 Turbo Cache 64MB (Can Share System Ram Up to 256MB) £44.95
ASUS NVIDIA EN6200 128MB £69.95
ASUS NVIDIA EN6600 256MB £104.95
ASUS NVIDIA EN6600 GT 128MB (CAN BE USED IN SLI MODE) £129.95
ASUS NVIDIA EN6800 256MB (CAN BE USED IN SLI MODE) £209.95
ASUS NVIDIA EN7800GT 256MB (CAN BE USED IN SLI MODE) £299.95
ASUS NVIDIA EN7800GTX 256MB (CAN BE USED IN SLI MODE) £399.95

Sound Cards

SoundBlaster 4.1 PCI £14.95
SoundBlaster 7.1 Player Live £19.95
Creative Audigy 2 ZS OEM £59.95
Creative Audigy 2 ZS Platinum Internal. £149.95
Creative Audigy 4 Pro External £169.95

CPU'S

AMD SEMPRON SOCKET A 2600+ Inc. Artic CopperSilent 2 Fan £54.95
AMD SEMPRON SOCKET 754 3000+ 64bit (Retail Boxed Inc. Heatsink & Fan) £69.95
AMD 64Bit 3000+ Socket 754 (Retail Boxed Inc. Heatsink & Fan) £109.95
AMD 64Bit 3000+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £109.95
AMD 64Bit 3200+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £139.95
AMD 64Bit 3500+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £169.95
AMD 64Bit 3700+ Socket 939 (Retail Boxed Inc. Heatsink & Fan) £209.95
AMD 64Bit 4000+ Socket 939 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £299.95
AMD 64Bit 4200+ Dual Core Socket 939 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £369.95
AMD 64Bit FX55 Socket 939 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £579.95
INTEL P4 3GHz SOCKET 775 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £129.95
INTEL P4 3.2GHz SOCKET 775 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £159.95
INTEL P4 3.4GHz SOCKET 775 1MB Cache (Retail Boxed Inc. Heatsink & Fan) £199.95

MOTHERBOARDS AMD SOCKET A (Retail Boxed)

Asrock K7S41GX SiS748, uATX, DDR333, VGA10/100 Lan, USB 2.0, 5.1 Audio, IDE, AGPx8 .....£39.95
Asus A7V8X-X VIA KT400(A), ATX, DDR400, 10/100 Lan, USB 2.0, 6Ch Audio, IDE AGPx8 .....£39.95
Asus A7V880 VIA KT880, ATX, DDR400, Gbit Lan, USB 2.0, 6Ch Audio, SATA, Raid, WiFi Port AGPx8 .....£49.95

MOTHERBOARD AMD SOCKET 754 (Retail Boxed)

Asus K8N-E Deluxe NF3 ATX, DDR400, Gbit Lan, USB 2.0, 1394, 8Ch Audio, 4 x SATA, Raid AGPx8 .....£69.95
Foxconn K8S760 MicroATX, DDR400,VGA Gbit Lan, USB 2.0, 1394, 6Ch Audio, 4 x SATA, Raid AGPx8 .....£49.95
Foxconn K8S755A ATX, DDR400, Gbit Lan, USB 2.0, 1394, 6Ch Audio, 4 x SATA, Raid AGPx8 .....£59.95

MOTHERBOARD AMD SOCKET 939 (Retail Boxed)

Asus A8V Deluxe, VIA K8T800Pro, AGPx8 Gbit Lan, USB 2.0, 1394, 8Ch Audio, 2 x SATA, Raid AGPx8 .....£74.95
Asus A8V-E Deluxe-NW S939 PCI-Express Gbit Lan, USB 2.0, 1394, 8Ch Audio, 2 x SATA, Raid £74.95
Asus A8N-SLi (Standard), ATX, PCI-Express, Gbit Lan, USB 2.0, 1394, 8ch Audio, 4 x SATA, Raid £104.95
Asus A8N-SLi Deluxe, ATX, PCI-Express, 2 x Gbit Lan, USB 2.0, 1394, 8ch Audio, 4 x SATA, Raid 5 .....£114.95

MOTHERBOARD INTEL SOCKET 775 (Retail Boxed)

ASROCK 775V88 VIA , ATX, ,DDR 40010/100 Lan, USB 2.0, 5.1Ch Audio, IDE 2x SATA RAID, AGPx8 .....£49.95
Asus P5RD1-V S775 PCI-E ATI Xpress 200 VGA DDR400 8Ch Audio SATA Raid 10/100 USB2 .....£74.95
Asus P5GDC Deluxe i915P, ATX, DDR2-533 & DDR400, Gbit Lan, USB 2.0, 1394, 8Ch Audio, SATA, Raid £99.95
Asus P5AD2-E-Premium PCIE i925XE S775 2xGbit Lan DDR2 1394/AB USB2 SATA&PATA Raid 8Ch Audio £139.95

Motherboard Bundles (Assembled)

ATX Midi Tower Case 400Watt PSU
FOXCONN Socket A M/Board 400FSB
1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
2x Front USB 2.0
AMD Sempron 2600+
256MB DDR 3200
5.1 On-Board Sound Card
Integrated SIS 3D Graphics Card
Integrated 10/100 Ethernet Card £139.95

ATX Midi Tower Case 400Watt PSU
ASUS A7V600-X Socket A M/Board
1xAGPx8 5xPCI 4x Rear USB 2.0 1x Parallel
2x Front USB 2.0 2x SATA Raid 0,1
AMD Sempron 3000+ Inc. Heatsink & Fan
512MB DDR 3200
5.1 On-Board Sound Card
Integrated 10/100 Ethernet Card £179.95

ATX Midi Tower Case 400Watt PSU
FOXCONN K8S760 Socket 754 M/Board
1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
2x Front USB 2.0 2x SATA Raid 0,1
AMD 64Bit 3000+ Inc. Heatsink & Fan
512MB DDR 3200
5.1 On-Board Sound Card
Integrated SIS 3D Graphics Card
Integrated 10/100 Ethernet Card £229.95

all power computing pcs are subject to availability and come with 2 year return to base, parts & labour warranty (free collection & return) on hardware faults only unless otherwise specified by manufacturer. industry standard practice is to quote a monitor crt size, the actual size is one inch less. details correct at time of going to press. prices, specifications subject to change without notice. all sales are subject to power computing ltd terms and conditions, a copy of which may be obtained on request. all trademarks are acknowledged.

all prices include vat.

E & OE

Most Major Credit Cards Accepted

To advertise in Micromart call
Shila Shah on 020 7316 9144

MICROMART

CLASSIFIED ADVERTISING

Index

Batteries & Adapters

Computerbattery.co.uk 172

Business & Services

Digital Data 179

Consumables & Disc Media

Britink 174,179
Cartridge Express 173
Manx 172
Offtek 177
Tonezone Consumables 177
Supply Line 179
Cartridge Shop 172

Data Recovery

Computer Recovery 168
Dataquest 168

Hardware

Computer Bargains 175
PC Connection 168
Sterling XS 170
PC Upgrade 176

Internet Services

1&1 Internet 172
123 Reg 171
Web Fusion 169
Namehog 176
Red Station 176
Fast Host 176

Memory

Offtek 177

Notebooks

Laptop Spares 179

PDAs & Mobile Comm

i2 Mobie Solutions 173

Peripherals & Accesories

Computer Bargains 175
Sterling XS 170

Repairs

Accent 179

Software

Saver Software 173

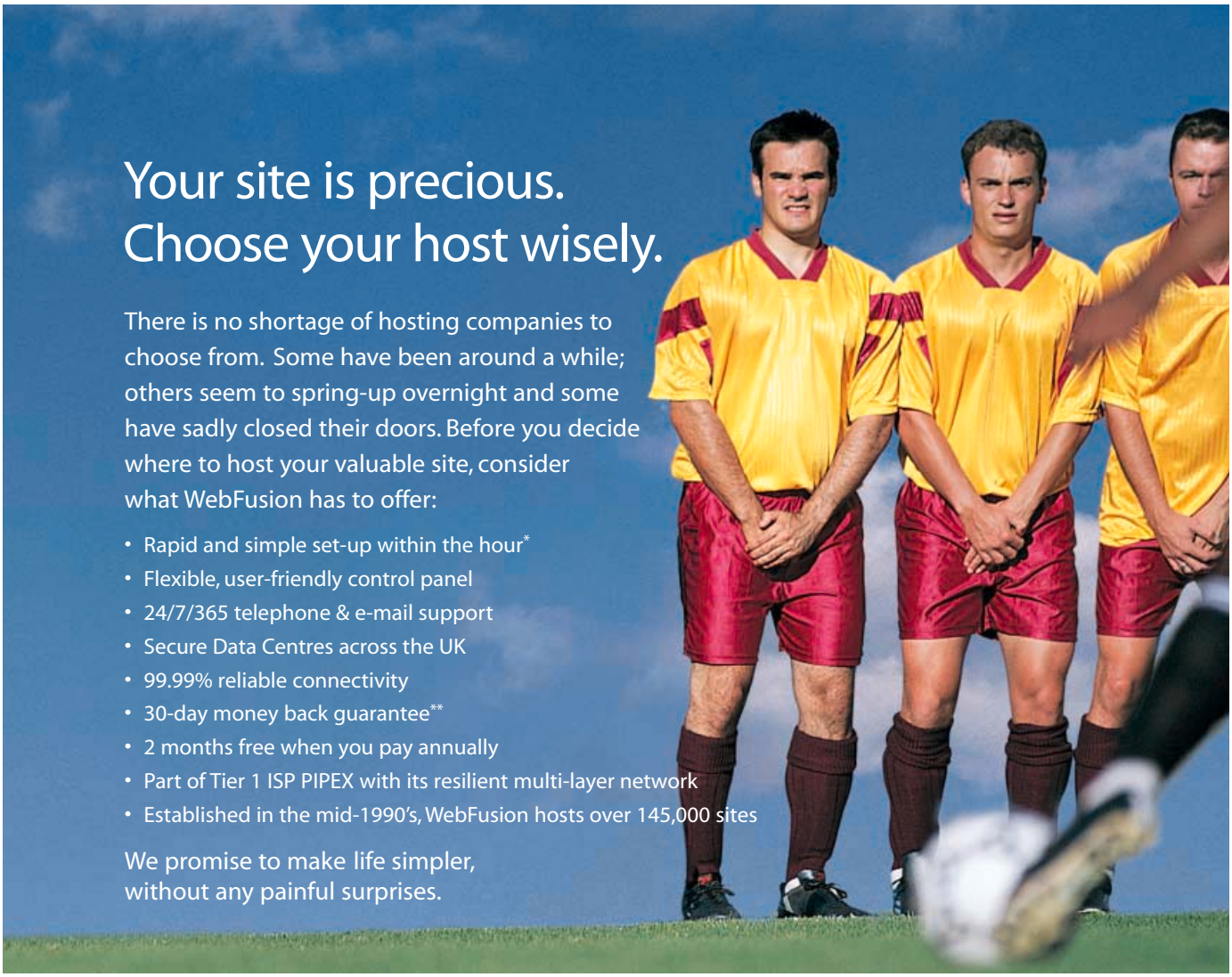
PCW Marketplace

Marketplace 179

LOST CRITICAL DATA ?!
Damaged.. Corrupted.. Deleted.
Don't Panic!
No Data No Charge
Guaranteed*
Computer Recovery Labs
Data recovery specialist
The solution is in our hands
Tel: 020 8230 1904
Web
ComputerRecoveryLabs.com
Email
Recovery@ComputerRecoveryLabs.com

DATA QUEST INTERNATIONAL LTD
DATA RECOVERY SPECIALISTS
• Free Diagnosis
• No Fix No Fee Policy
• 24hr Comprehensive Service
• In-Lab Recovery Options
• Clean Room Facilities
Tel: 0845 2009241
Fax: 023 9263 9664
E-mail: sales@dq-int.co.uk
Website: www.dq-int.co.uk

Look across the pond!
For more than 20 years,
PC Connection and MacConnection have offered the very best values on a HUGE selection of PC and Mac hardware and software to a world of customers.
COUNT ON US FOR:
Competitive U.S. prices • More than 100,000 products
Over 1,400 manufacturers • Knowledgeable customer service
Expert technical support • Rapid, dependable delivery
So surf our Web sites and catch some of the best IT deals anywhere.
PC Connection
www.pcconnection.com
001-603-446-0095
MacConnection
www.macconnection.com
001-603-446-0092
730 Milford Road, Merrimack, NH 03054-4631 • FAX: 001-603-683-5775
Source: V4089. Please reference when ordering.



Your site is precious. Choose your host wisely.

There is no shortage of hosting companies to choose from. Some have been around a while; others seem to spring-up overnight and some have sadly closed their doors. Before you decide where to host your valuable site, consider what WebFusion has to offer:

- Rapid and simple set-up within the hour*
- Flexible, user-friendly control panel
- 24/7/365 telephone & e-mail support
- Secure Data Centres across the UK
- 99.99% reliable connectivity
- 30-day money back guarantee**
- 2 months free when you pay annually
- Part of Tier 1 ISP PIPEX with its resilient multi-layer network
- Established in the mid-1990's, WebFusion hosts over 145,000 sites

We promise to make life simpler, without any painful surprises.

Linux Hosting

The WebFusion Linux range delivers the benefits of an open source environment in packages tiered to match the needs of all sizes of business. Access flexible webspace supporting applications such as PHP cost-effectively and simply.

Entry level package	£7.95 a month
Business-grade package	£19.95 a month

2 months FREE when you pay annually

Windows Hosting

Created in collaboration with Microsoft®, secure .NET hosting from WebFusion brings the latest Windows hosting technology and .NET development tools within your reach - first.

Build a stylish, dynamic site with ease using DotNetNuke - FREE with all Windows accounts

.Net Home package	£5.95 a month
.Net Business-grade pack	£19.95 a month

2 months FREE when you pay annually

Dedicated Servers

Support your business with hosting and security systems giving the ultimate in power, control and reliability for all budgets.

Intel Certified Servers
Now from only £79.99
per month plus set-up

Un-metered DataTransfer†
Your server has unrestricted access to the PIPEX network, use as much bandwidth as you want with no additional charges.

† Limited period offer. Applies to DS1-DS4 range only. Terms & Conditions apply.

* Shared hosting, 9am-5pm Mon-Fri. Conditions apply. ** Applies to shared hosting accounts only.

New Low Price Reseller Packages £26.99 a month

Add value to your business and offer your customers a broader portfolio with our Reseller package. Becoming a WebFusion Reseller gives you the power to develop your own web hosting business, and because we're part of leading Tier 1 ISP PIPEX you can also offer your clients a broadband service.

All major credit cards welcome. Prices exclude VAT @ 17.5%.
WebFusion is part of the PIPEX Group.

WebFusion

www.webfusion.co.uk 0800 0317 800

To advertise in Micromart call
Shila Shah on 020 7316 9144

THE BEST DEALS ON NEW, EXCESS AND REFURBISHED LAPTOPS & PCs. ESTABLISHED 1991

ORDER ON-LINE | www.sterlingxs.co.uk | **See website for full list of products**

HIGH SPEC LAPTOP BARGAIN

ADVENT 7046 NOTEBOOK
Intel Mobile Pentium 4, 3.0ghz processor
512mb DDR ram, 40gb hard drive
15.1" high resolution TFT screen (1400 x 1050)
nVidea GeF FX-5200 64mb DDR dedicated graphics
DVD+RW drive - play & record CDs & DVDs
AC97 audio, with built in speakers
UK keyboard & touchpad pointing device
Wireless network interface (high speed IEEE802.11g)
56k modem, 10/100 network interface
4x USB 2.0 ports, parallel port
1x Firewire IEEE1394 & infra red ports
Three in one card reader
VGA & TV out ports
2x pcmcia type II slots
Li-ion battery and AC adaptor/charger
Windows XP Home, MS Works 7, & Nero Burning & Power Cinema Suite
As new and boxed (factory refurb) with recovery cds
One year manufacturer's collect & return warranty

£499.99 ex-vat
£587.49 inc-vat

DVD+RW NOTEBOOK SPECIAL

PACKARD BELL E2310 NOTEBOOK
Intel Celeron Mobile M 350 1.3ghz processor
512mb DDR ram, 40gb hard drive
DVD+RW drive - play & record CDs & DVDs
15" TFT display (1024x768 resolution)
AC97 audio, with built in speakers
UK keyboard & touchpad pointing device
64mb shared graphics - Intel 852GM
56k modem & 10/100 network
4x USB 2.0 ports
VGA port & pcmcia type II slot
Lion battery & charger
MS Windows XP Home preloaded with COA, DVD/CDRW software
Factory refurbished as new & boxed
with one year RTB warranty

£379.99 ex-vat
£469.99 inc-vat

IFRIEND NC20214 LAPOP

IFRIEND NC202i4 LAPTOP
Intel Celeron 2GHz processor
256mb ram, 20gb hard drive
14.1" TFT screen (1024x768)
Integral CD rom
UK keyboard & trackpad pointing device
56k modem, 10/100 network interface
2x USB ports, Parallel port
IEEE 1394 firewire port, VGA,
PS2 & TV out ports
Li-ion battery & AC adaptor/charger
Windows XP Home.
New & boxed with manual,
recovery cds & carry case
One year on-site collect & return IFriend warranty

£299.99 ex-vat
£352.48 inc-vat

NEW LAPTOP SPECIAL CLEARANCE

Brand new IFriend NA243rx5 laptop,
with powerful Athlon processor
AMD Athlon XP2400+ processor
256mb DDR ram, 30gb hard drive
15.1" TFT display (1024x768)
Integral DVD/CDRW combo drive
Soundblaster pro compatible sound system,
with AC97 direct sound 3D support
Graphics up to 64mb shared
UK keyboard & trackpad pointing device
56k modem, 10/100 network interface
4x USB 2.0 ports & IEEE 1394 firewire port
VGA & 1x pcmcia (type II) ports
Li-ion battery and AC adaptor/charger
New and boxed with driver cds
No operating system included.
One year on-site collect & return IFriend warranty

£349.99 ex-vat
£411.24 inc-vat

PANASONIC TOUGHBOOK CF-27

Toughbooks feature a magnesium alloy case.
20 times stronger than plastic.
Shock resistant & water resistant.
Ideal for industrial/outdoor applications.
Intel Pentium 266mhz MMX processor
64mb ram 4gb hard disk
12.1" TFT display (800x600)
Internal DVD rom
UK keyboard & Touchpad
Sound, USB, serial, parallel, ps2, vga ports
Li-ion battery & charger
Refurbished with 90 day RTB Warranty
Also available preloaded with Windows 98, with COA & backup CD at £234.99 inc VAT

£169.99 ex-vat
£199.99 inc-vat

IBM THINKPAD T23 SPECIAL

IBM THINKPAD T23 with DVD
Corporate quality refurbished slimline notebook
(weighs just 2.1kg & 3.3cm thin)
Intel Pentium III mobile 1GHZ processor
256mb ram & 20gb hard drive
14.1" TFT screen (1024x768)
Integral DVD drive, Swappable 3.5" 1.44mb floppy drive
S3 savage video,Crystal soundfusion WM audio
UK keyboard & trackpoint pointing device
56k modem & 10/100 network, Parallel serial, S-video
VGA and PS2 ports, 2x Type II PCMCIA slots & 2x USB ports
Li-ion battery & AC adaptor/charger
Refurbished with 90 days RTB warranty
Windows 2000 professional pre-installed with COA (backup cd included)

£299.99 ex-vat
£352.49 inc-vat

ADVENT SLIMLINE LIFESTYLE MEDIA CENTRE

Advent MC3035 mini tower
Intel P4 2.8ghz processor
512 mb ram, 160gb hdd
DVD Rewriter drive
7 in one card reader
56k modem & 10/100 network
OnBoard AC'97 Sound Card
FX 5200 graphics card with 128mb DDR ram, with VGA & S-video
TV tuner, with remote control
5 USB ports, 2 IEEE 1394 Firewire ports
serial, parallel ports.
Wireless UK keyboard & wireless wheel mouse
Windows XP media centre & Works,
Power DVD & Nero Burner with restore cds
As new and boxed (factory refurb)
One year return to base warranty

£340.42 ex-vat
£399.99 inc-vat

COMPAQ ARMADA SPECIAL

COMPAQ ARMADA 7400
Intel Pentium II, 300mhz processor
256mb Sdram memory
6gb hard drive
13.3" TFT screen (1024x768)
Integral cd rom drive, swappable 3.5" floppy drive
Sound system, with built in speakers
4mb AGP graphics
UK keyboard, with pointing device
USB , parallel, infrared & serial ports
VGA and PS2 ports
2x Type II PCMCIA slots
Li-ion battery & AC adaptor/charger
2nd user with 90 days RTB warranty

£149.99 ex-vat
£176.24 inc-vat

Updated daily, don't forget to check out our website for full list of currently available products

SAME DAY DISPATCH

Sterling XS
www.sterlingxs.co.uk

Sterling Management Systems Ltd
13-15 Barrack Road,
Guildford, Surrey, GU2 9ZW

Tel: 01483 301331
Fax: 01483 533079
e-mail: sales@sterlingxs.co.uk

PLACE YOUR ORDER ON-LINE OR BY PHONE, FAX OR POST

Prices exclude delivery at Initial City Link standard rates by weight. Goods have a 1-year RTB warranty unless otherwise stated. Credit card payments are subject to a 2.5% surcharge, no surcharge for Switch, Delta or Solo. All trademarks acknowledged. Stocks are finite - please telephone before travelling to confirm availability. Photos for illustration only. E&OE.

LIMITED PERIOD OFFER
Transfer your .uk domain name for FREE
Transfer your .com, .net, .org domain for half price, now only £9.99

It's as simple as...

It's never been easier or cheaper to have your own domain name! 123-reg delivers a totally automated service with the best value on the Internet. You will not find a more cost-effective or convenient way of buying and managing your domain names.

Price per year inclusive of all fees

.co.uk .org.uk/.me.uk	£2.59
.com/.net/.org .info/.biz/.name	£8.99
.tv/.cc	£30.95

Some domains are payable 2-yearly, visit 123-reg.co.uk for more info.

Bulk Discounts:
Generous discounts available when you register multiple domains.

Quickly create a great looking web site online with 123-reg Site Builder - it's easy!

The new 123-reg Site Builder is a revolutionary product in the UK that leaves you with no excuse not to have your own high quality web presence, hosted by Europe's leading web hosting company.

£4.20 per month*

There's no better place to host your site!

Our 123-reg hosting packages are fantastic value for money. They are all feature rich and include at least 100MB of webspace, masses of mail boxes and free webmail.

Professional web hosting has never been so affordable.

from £1.59 per month

A one-off set-up fee applies.

* Monthly equivalent, paid annually.

We welcome all major credit cards.
Prices exclude VAT @ 17.5%.

123-reg.co.uk is part of the PIPEX Group.

123-reg.co.uk

For all your domain and web hosting solutions visit: www.123-reg.co.uk

www.zaqit.com
try it....
because....?

Cartridgeshop.co.uk

Epson Compatibles
400/440/460/480/580/600/640/660/670/700/740/750/760/800/850/880/900/980/C20/C40

Black and Colour
From £1.99 a Pair

Epson Compatibles
C70/C80/C82/C64/C66/C84
CX5400/CX5200/CX3600/CX3650/RX420/RX425

Set of 4
From £5.99

Epson Compatibles
680/790/810/830/870/890/895/900/915/925
C42/C44/C46/C60/C62
CX3200

Black And Colour
From £2.99 a Pair

Epson Compatibles
R200/R300/RX500/RX600/RX620

Set of 6
From £6.99

Just a selection of our range. All prices includes VAT & Delivery

Tel-0845 890 1589 E&OE

www.printconsumables.com

PRINTER CARTRIDGES DIRECT FROM Manx Print Care

PREMIUM OR BUDGET COMPATIBLES - YOUR CHOICE

OUR 12TH YEAR AS THE SPECIALISTS FOR ALL MAKES AND MODELS
MANUFACTURERS, REMANUFACTURERS & SUPPLIERS OF QUALITY PRINTER PRODUCTS TO THE UK, IRELAND & BEYOND. DISCOUNTS FOR BULK TO TRADE

buy online
www.printconsumables.com

BUSINESS PUBLIC SECTOR HOME USER
Preferred supplier to Government Users

OVERNIGHT DESPATCH ON WIDE RANGE OF TONER CARTRIDGES — COMPATIBLE AND ORIGINAL
KEENEST PRICES ON QUALITY TONERS BAR NONE. WE SUPPLY OUR REMANUFACTURES TO MAJOR PLCs, *AND THEY STAY WITH US! ENOUGH SAID.*
SUPPORTING HP LASERJET/CANON/NEC/BT & MANY OTHERS — RING FOR QUOTE — YOU WILL BE BACK FOR MORE!!

JETTMANX THE SUPERB REFILL INKS & KITS SPECIFICALLY FORMULATED FOR YOUR PRINTER
(TRIED 'UNIVERSAL' INKS? NO GOOD? TRY JETTMANX!)
FULL RANGE COVERING HP/CANON/EPSON/APPLE/LEXMARK/OLIVETTI
INDIVIDUAL FORMULA FOR EACH MODEL
OVER 40 STARTER KITS AND OVER 70 INKS. Specially made for your printer. BUY THE BEST. Starter kits from £10.95 incl with full clear instructions give between 3 to 9 fills according to model. Bulk inks available from 60ml upwards.
Inks now available for new Lexmark printers and HP No. 56/57/27/28/14 carts & Canon BCI3/BCI6/BCI24
VISIT OUR WEBSITE FOR INK LISTINGS AND SEE WHY THERE IS NO SUCH THING AS "UNIVERSAL" INK. ABOUT 80% OF OUR INK ORDERS ARE REPEATS OR PERSONAL RECOMMENDATIONS.

TEL or FAX FREE on TEL 0800 0 19 06 07
FAX 0800 0 56 66 10
OVERSEAS: (+44) 1624 801159
E-Mail: info@printconsumables.com
Mail: Clock Tower Industrial Park, Foxdale IM4 3HF

* SURESHARP PAPERS * REFILL TONERS
* NEW! COMPATIBLE COLOUR TONERS

QUALITY RIBBONS TO SUIT DOT MATRIX PRINTERS, POINT OF SALE MACHINES, ETC. HUGE RANGE.
OUR REPUTATION IS YOUR GUARANTEE

www.computerbattery.co.uk

POWER UP!
Acer, Apple, Compaq, Dell, IBM, Sony, Toshiba and many others

Use the **Quick Selector** on our web site to find the power products available for your Laptop. We have a **massive range** of Batteries and AC Apapters always held in stock.
or call us on 0870 872 6730

Laptop Batteries
Power Adapters
Car & Airplane Adapters
PDA Batteries
Digital Camera Batteries

FAST, FREE *Delivery to Europe*
Usually next day delivery to mainland UK

2-power distributor

acer Apple Compaq DELL IBM SONY TOSHIBA hp

all trademarks acknowledged

Don't Buy Printer Cartridges
until you've visited www.cartex.co.uk

UK's Lowest Prices - Guaranteed*

Buy Direct From The Manufacturer Of Compatible Cartridges

Order Online For FREE Delivery! **No Minimum Order**

Brother Compatibles	Each**
LC-21/600BkCMorY	£1.75
LC-21/600 QP.	£5.86
LC-25/700BkCMorY	£1.75
LC-25/700 QP.	£5.86
LC-31/800BkCMorY	£1.75
LC-31/800 QP.	£5.86
LC-41/900 Bk	£2.34
LC-41/900 CMorY	£1.75
LC-41/900 QP.	£6.45
Canon Compatibles	**Each****
BCI-15 Bk 2 Pack	£2.34
BCI-15 Col 2 Pack	£2.93
BCI-15 TP (2+2)	£4.69
BCI-21 Bk	£1.16
BCI-21 Col	£1.75
BCI-21 TP	£2.34
BCI-24 Bk	£1.16
BCI-24 Col	£1.75
BCI-24 TP	£2.34
BCI-3 Bk	£1.16
BCI-3 CMorY	£1.16
BCI-3 QP	£4.10

Canon Comps	Each**
BCI-3 Photo`s	£1.16
BCI-6 Bk	£1.16
BCI-6 CMorY	£1.16
BCI-6 QP	£4.10
BCI-6 Photo`s	£1.16
BC-02 Bk	£5.86
BC-05 Col	£10.56
BC-02\05 TP	£15.26
Epson Comps	**Each****
SO20093 Bk	£1.16
SO20089 Col	£1.75
SO93\89 TP	£2.34
SO20108	£1.16
SO20187 Bk	£1.16
SO20191 Col	£1.75
SO187\191 TP	£2.34
SO20193	£1.75
TOO7 Bk	£1.16
TOO8 Col	£1.75
TOO7\08 TP	£2.34
TOO9 Photo	£2.34
TOO7\09 TP	£3.51

Epson Comps	Each**
TO13 Bk	£1.16
TO14 Col	£1.75
TO13\14 TP	£2.34
TO17 Bk	£1.16
TO18 Col	£1.75
TO17\18 TP	£2.34
TO19 Bk	£1.16
TO20 Col	£1.75
TO19\20 TP	£2.34
TO26 Bk	£1.16
TO27 Col	£1.75
TO26\27 TP	£2.34
TO28 Bk	£1.16
TO29 Col	£1.75
TO28\29 TP	£2.34
TO36 Bk	£1.16
TO37 Col	£1.75
TO36\37 TP	£2.34
TO40 Bk	£1.16
TO41 Col	£1.75
TO40\41 TP	£2.34
TO321 Bk	£2.34

Epson Comps	Each**
TO322\3or4	£1.75
TO321-4 QP	£6.45
TO331 Bk	£1.75
TO332\3\4\5or6	£1.75
TO331-6 SP	£8.80
TO341 Bk	£2.34
TO342\3\4\5\or6	£2.34
TO347or348	£2.34
TO341-348Pack	£16.43
TO38 Bk	£1.16
TO39 Col	£1.75
TO38\39 TP	£2.34
TO422\3or4	£1.75
TO431 HCBk	£2.34
TO441 Bk	£1.75
TO442\3or4	£1.75
TO441-4 QP	£5.86
TO431\442-4QP	£6.45
TO481 Bk	£1.75
TO482\3or4	£1.75
TO485or6	£1.75
TO551 Bk	£1.75

Epson Comps	Each**	
TO552\3or4	£1.75	N/A
TO551-4 QP	£5.86	N/A
Dell Compatibles	**Each****	**Pt Ex**
720\A920 Bk	£15.26	£12.91
720\A920 Col	£16.43	£12.91
720\A920 TP	£30.53	£24.66
A940\A960 Bk	£14.08	£11.74
A940\A960 Col	£15.26	£11.74
A940\A960 TP	£28.18	£22.31
HP Compatibles	**Each****	**Pt Ex**
51625 Col	£10.56	£7.04
51626 Bk	£7.04	£4.69
51629 Bk	£7.04	£4.69
51633 Bk	£7.04	£4.69
51641 Col	£11.74	£8.21
51645 Bk	£5.86	£3.51
51649 Col	£11.74	£8.21
C1823 Col	£11.74	£8.21
C4841\2or3	£9.39	N/A
C4844 Bk	£9.39	N/A
C5010 Col	£8.21	£7.04
C5011 Bk	£7.04	£5.86

HP Compatibles	Each**	Pt Ex
C6578 Col	£11.74	£8.21
C6614 Bk	£7.04	£4.69
C6615 Bk	£5.86	£3.51
C6625 Col	£11.74	£8.21
C6628 Bk	£11.74	£9.39
C6656 Bk	£9.39	£7.04
C6657 Col	£11.74	£8.21
C6658 Photo	£11.74	£8.21
C8727 HCBk	£9.39	£7.04
C8728 Col	£11.74	£8.21
51626\51625 TP	£16.44	£10.56
51629\51649 TP	£18.79	£12.91
51645\51641 TP	£16.44	£10.56
51645\C1823 TP	£16.44	£10.56
51645\C6578 TP	£16.44	£10.56
C5011\5010 TP	£14.09	£11.74
C6614\51649 TP	£17.61	£11.74
C6615\1823 TP	£16.44	£10.56
C6615\\6578 TP	£16.44	£10.56
C6615\6625 TP	£16.44	£16.44
C6656\6657 TP	£19.96	£14.09
C8727\8728 TP	£19.96	£14.09

Lexmark Comps	Each**	Pt Ex
10N0016 Bk	£12.91	£10.56
10N0026 Col	£14.09	£10.56
10N0217 Bk	£10.56	£8.21
10N0227 Col	£11.74	£8.21
12A1970 Bk	£11.74	£9.39
12A1975 HCBk	£12.91	£10.56
12A1980 Col	£12.91	£9.39
12A1985 HCCol	£14.09	£10.56
12A1990 Photo	£15.26	£11.74
15M0120 Col	£14.09	£10.56
15M0125 HCCol	£15.26	£11.74
17G0050 Bk	£11.74	£9.39
17G0060 Col	£12.91	£9.39
18L0032 Bk	£14.09	£11.74
18L0042 Col	£15.26	£11.74
10N0016\26 TP	£28.19	£19.96
12A1970\80 TP	£23.49	£17.61
12A1975\85 TP	£25.84	£19.96
17G0050\60 TP	£23.49	£17.31
18L0032\42 TP	£28.19	£22.31
13400HC BK	£11.74	£8.21
13619HC Col	£12.91	£9.39

100% Guaranteed **All Prices Listed INCLUDE VAT** **Established 1993**

We stock Original and Compatible Inkjet, Laser, Fax and Copier Cartridges for all Printer Makes & Models from Apple to Xerox

Key:-
TP = Twin Pack (1 black and 1 colour)
QP = Quad Pack (1 black, 1 cyan, 1 magenta and 1 yellow)
SP = Six Pack (1 black, 1 cyan, 1 light cyan, 1 magenta, 1 light magenta + 1 yellow)
Pt Ex = Part Exchange - empty exchange cartridge required
Comps = Compatible inkjet cartridge

Manufacturer of: eurojet

Call now on: 0870 243 5610

20 sales\enquiry lines open Monday - Friday 8:30am - 5:30pm

Fax: 0870 243 5611 email: info@cartex.co.uk

*Find the same product cheaper & we will beat it by up to 10%. Delivery charges included in price comparison. Verification required. ** When purchased in multiple quantities of 5. Single units available. Prices may fluctuate, please check website.

NEW FOR POCKET PC!
Easy to use data collection system

Questor is a user-configurable data collection solution for devices based on Microsoft Pocket PC and Windows Mobile operating systems*. Questor enables you to design your own tailor-made mobile data collection application on the PC, incorporating a variety of step types including bar code data input and signature capture. It's a quick, easy and low cost alternative to programming that requires no specialist skills.

Use Questor for:
- maintenance logging
- sales data capture
- stock counting
- meter reading
- asset tracking
- market research
- quality control

Step types include:
- alphanumeric input
- list selection
- 2-option choice
- bar code input
- signature capture

Questor

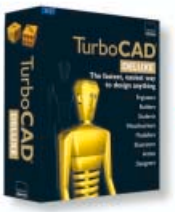
Powered by Pendulum

*New Questor for Windows supports devices based on PPC2002 and WM2003, plus some CE .NET. Please call for further details.

i2 mobile solutions www.i2mobilesolutions.com/q 0870 750 4034

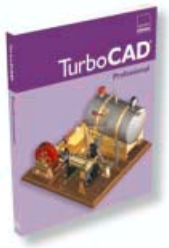
SaverSoftware.co.uk

BRANDED SOFTWARE - UNBEATABLE PRICES



IMSI TURBOCAD 11 DELUXE EDITION
£69.99
Save £10

£499.99
Save £50
IMSI TURBOCAD 11 PROFESSIONAL



IMSI FLOORPLAN 3D ® 10 PROFESSIONAL
£42.99
Save £7

£24.99
Save £5
IMSI FLOORPLAN ® 3D VERSION 10 ONLY

For further offers available, please email us today.
email: mail@saversoftware.co.uk
Order online or our through our dedicated order line

Freephone: 0800 458 8071

Prices are correct at the time of going to press

To advertise in Micromart call
Shila Shah on 020 7316 9144

Finest Quality

CANON & EPSON

Compatible Ink Cartridges

We only stock **brand new** cartridges - not recycled or refilled cartridges.
Our ink cartridges are manufactured to **ISO9001** standards, are **guaranteed** to perform to the same standard as original cartridges, and will not invalidate your printer warranty. All come with a **100% money back** guarantee!

Epson Stylus:
C20 C40 400 440 460 480 580 600 640 660 670 700 740 750 760 880 980, 1160
Black Ink Cartridges
£1.99 each
3 pack: **£4.99**
Colour Ink Cartridges
£2.99 each
3 pack: **£7.99**

Epson Stylus:
C42 C44 C46 C60 C62 CX3200 680 790 810 830 870 890 900 915 925 1290
Black Ink Cartridges
£2.99 each
3 pack: **£7.99**
Colour Ink Cartridges
£3.99 each
3 pack: **£9.99**

Epson Stylus:
C64 C66 C70 C80 C82, C84 C86 CX3600 CX6600 RX420
Black Ink Cartridges
£3.99 each
3 pack: **£9.99**
Colour Ink Cartridges
£2.99 each
any 3 colours: **£7.99**
Full sets of 4 cartridges:
(Black/Cyan/ Magenta/Yellow)
£11.99 per full set
3 full sets: **£32.99**

Epson Stylus:
Photo R200 R300 R300M R320 RX500 RX600 RX620
Black Ink Cartridges
£2.99 each
3 pack: **£7.99**
Colour Ink Cartridges
£2.99 each
any 3 colours: **£7.99**
Full sets of 6 cartridges:
(Black/Cyan/Mag/Yell/P.Cyan/P.Mag)
£15.99 per full set
3 full sets: **£45.99**

"Premier Ink Supplies stock the compatible cartridges that achieved top ratings under independent testing, and provide all the guarantees of quality, reliability and service that should assure any customer"
- Independent on Sunday, September 2004.
THE INDEPENDENT ON SUNDAY

We stock the ONLY Epson compatible ink cartridges tested and recommended by the British Journal of Photography: "The inks do a sound job – producing prints preferable to OEM inks on some occasions, as good as on the majority of occasions"
- British Journal of Photography, April 2005
British JOURNAL OF PHOTOGRAPHY 2005

Canon: *iP1000, P1500 iP2000, MP110, MP130 i250, i320, i350, i450, i455 i470, S100, S200, S300 S330, BJC 2000, 4000, 5000*
Black Ink Cartridges
£1.99 each
3 pack: **£4.99**
Colour Ink Cartridges
£2.99 each
3 pack: **£7.99**

Canon: *iP3000, iP4000 iP5000, iP6000, iP8500, i550 i560, i850, i865, i950, i965 i990, i9950, S400, S450, S500 S630, S750, BJC3000, 6000*
Black Ink Cartridges
£2.99 each
3 pack: **£7.99**
Colour Ink Cartridges
£2.99 each
3 pack: **£7.99**

Epson Genuine Original Cartridges

T0551/552/553/554 Full Set of 4 Original Epson cartridges (RX420/425):	**£19.99**
T0441/452/453/454 Full Set of 4 Original Epson cartridges (C66/C86):	**£29.99**
T0481/2/3/4/5/6 Full Set of 6 Original Epson cartridges (R200/R300):	**£39.99**
T0540/1/2/3/4/7/8/9 Full Set of 8 Original Epson cartridges (R800/1800):	**£79.99**
T0591/2/3/4/5/6/7/8/9 Full Set of 9 Original Epson cartridges (R2400):	**£79.99**

HP Genuine Original Cartridges

No.15 (c6615d) Original HP Black Ink Cartridge:	**£12.99**
No.27 (c8727a) Original HP Black Ink Cartridge:	~~Was:£12.99~~ **Now: £11.99**
No.28 (c8728a) Original HP Colour Ink Cartridge:	**£14.99**
No.56 (c6656a) Original HP Black Ink Cartridge:	~~Was:£14.99~~ **Now: £11.99**
No.57 (c6657a) Original HP Colour Ink Cartridge:	**£19.99**
No.58 (c6658a) Original HP Photo Ink Cartridge:	**£17.99**
No.59 (c9359a) Original HP Grey Ink Cartridge:	**£17.99**
No.339 (c8767e) Original HP Black Ink Cartridge:	~~Was:£19.99~~ **Now: £17.99**
No.344 (c9363e) Original HP Colour Ink Cartridge:	~~Was:£22.99~~ **Now: £19.99**

Lexmark Genuine Original Cartridges

No.17 (10N0217) Original Lexmark Black Ink Cartridge:	**£12.99**
No.27 (10N0227) Original Lexmark Colour Ink Cartridge:	**£14.99**
No.32 (18C0032) Original Lexmark Black Ink Cartridge:	**£12.99**
No.33 (18C0033) Original Lexmark Colour Ink Cartridge:	**£15.99**
No.48 (17G0648) Original Lexmark Black Ink Cartridge:	**£12.99**
No.19 (15M2619) Original Lexmark Colour Ink Cartridge:	**£15.99**

Orink Photographic Papers

Superb professional quality resin-coated photographic papers, specifically designed for use with Epson and Canon inkjet printers. Fast drying, with super-white finish.

255gsm Gloss Photo Paper, High Quality, 10x15cm, 50 sheets:	**£6.99**
255gsm Gloss Photo Paper, High Quality, A4, 20 sheets:	**£7.99**
251gsm Satin Photo Paper, High Quality, 10x15cm, 50 sheets:	**£6.99**
251gsm Satin Photo Paper, High Quality, A4, 20 sheets:	**£7.99**

• Royal Mail 1st Class Delivery • Secure Online Ordering •
• All Prices Include VAT • Freephone Number •
• No Minimum Order • P&P 99p Per Order •

Premier
INK SUPPLIES

www.PremierInk.co.uk
0800 1075 270

Premier Ink Supplies
Unit 8, Rigby Close
Heathcote Industrial Estate
Warwick CV34 6TH

Secure Online Shopping with:
Lloyds TSB Cardnet
protx

www.computerbargains.co.uk

WARRANTY. TRADE PRICES

Order On-Line at www.computerbargains.co.uk

SHIPPING. TRADE PRICES DIRECT TO THE PUBLIC. NO CREDIT CARD SURCHARGE. FREE TECHNICAL SUPPORT.

SAME DAY SHIPPING. FREE TECHNICAL SUPPORT. NO CREDIT CARD SURCHARGE. ALL GOODS BRAND NEW WITH

TOSHIBA
CD-RW + DVD 15" TFT WIRELESS NOTEBOOK
£399 +VAT £468.83 inc VAT

- Toshiba Satellite Pro L10, Intel Celeron M360 CPU
- 256MB Ram, 40GB HDD, Modem, Lan & Wireless
- CD-RW + DVD Combo Drive, 15" TFT Colour Display
- Microsoft Windows XP Home Software
- Brand New with 1 year Toshiba warranty
- Upgrade to 512MB Ram add £25+VAT.
- Notebook Carry Case add £20+VAT (£2

BUY NOW PAY NOTHING FOR 6 MONTHS

HP PAVILION
A622N P4 2.8GHz 512MB/160GB DVD-RW
£349 +VAT £410.08 inc VAT

- HP Pavilion A622N PC. Intel Pentium 4 2.8GHz CPU
- 512MB DDR SD RAM, 160GB Hard Drive, 3.5" FDD
- DVD-Rewriter Drive, 9 in1 Card Reader, Modem & Lan
- MS Windows XP Home, Works & Anti Virus software
- HP factory clearance refurb stock with 1 year warranty
- 17" CRT Monitor add £75+VAT,15" TFT add £109+VAT
- 17" TFT Monitor add 139+VAT (£163.33inc VAT)

iFRIEND
1.2GHz 256MB/30GB CDRW+DVD NOTEBOOK
£299 +VAT £351.33 inc VAT

- iFriend NC123rx4 Notebook, 1.2GHz VIA CPU
- 256MB Ram, 30GB Hard Drive
- 14.1" 1024 x 768 Res Colour TFT Screen
- Built in CD-RW + DVD Combo Drive
- 4x USB Ports, Modem, Lan & VGA Ports
- 1 year manufacturers collect & return warranty
- Windows XP Home Software add £50+VAT (£3

1 YEAR COLLECT & RETURN WARRANTY

HP COMP
ATHLON XP3000+ 512MB CD-RW + DVD PC
£279 +VAT £327.83 inc VAT

- Compaq Presario SR1135CL PC.
- AMD Athlon XP3000+ CPU 512MB Ram, 120GB HDD
- CD-RW & DVD ROM Drive, Built in Modem & Lan
- MS Windows XP Home, Works & Anti Virus software
- HP factory clearance refurb stock with 1 year warranty
- 17" CRT Monitor add £75+VAT,15" TFT add £109+VAT
- 17" TFT Monitor add 139+VAT (£163.33inc VAT)

DELL
LATITUDE C610 1GHz CD-RW NOTEBOOK
£269 +VAT £316.08 inc VAT

- Dell Latitude C610 Notebook, Intel Pentium III 1GHz
- 256MB Ram, 20GB Hard Drive, CD-RW Drive
- 14.1" TFT Colour Screen with 1024 x 768 res
- 3.5" Floppy Drive, Modem and Network
- Serial, Parallel, VGA, PS2, PCMCIA and
- Microsoft Windows 98 plus Recovery CD
- Dell refurb stock with 6 months warranty.

DELL FACTORY REFURBISHED

iFRIEND
AMD ATHLON XP2400+ CD-RW+DVD NOTEBOOK
£379 +VAT £445.33 inc VAT

- iFriend NA183rx4 Notebook. AMD Athlon XP2400+
- 256MB Ram, 30GB Hard Drive, Modem & Lan Ports
- CDRW + DVD Combo Drive, 14.1" TFT Colour Screen
- USB Ports, Firewire, PCMCIA, VGA and Audio ports
- and new and boxed with 1 year manufacturers
- collect and return warranty plus technical support.
- Win XP Home add £50+VAT. 512MB Ram £30+VAT

DELL PENTIUM III
2ND USER DESKTOP PCS
£45 +VAT £52.88 inc VAT

- Dell Optiplex GX110 PC with Intel Pentium III 667MHz CPU, 128MB Ram, 20GB Hard Drive, 3.5" Floppy Drive, CD ROM Drive, Serial, Parallel USB & Lan port
- Fujitsu Siemens P4 1.8GHz PC with 256MB Ram, 20GB HDD, 3.5" FDD, CD ROM, Lan & USB P
- Preloaded with Win XP Pro £139+VAT (£163.

ORDER NOW FOR NEXT DAY DELIVERY

FAMOUS BRAND
15.4" WIDESCREEN WIFI DVD-RW NOTEBOOK
£479 +VAT £562.83 inc VAT

- Famous Brand Notebook, Intel Cel Mobile 1.3GHz
- 512MB Ram, 50GB HDD, DVD Multidrive Rewriter
- 15.4" Widescreen display with ATI Radeon graphics
- USB ports, Modem, Lan & Built in Wireless Lan
- Microsoft Windows XP Home Software
- clearance/refurbished stock, factory sealed in
- condition with 1 year warranty.

COMPAQ
ARMADA M700 PIII-650MHz NOTEBOOK
£225 +VAT £264.38 inc VAT

- Compaq Armada M700, Intel Pentium III-650MHz CPU
- 256MB Ram, 12GB Hard Drive, 24x CD ROM Drive
- Built in 56K Modem and 10/100 Network Card
- 14.1" 1024 x 768 Resolution TFT Colour Display
- Serial, Parallel, VGA, USB and PCMCIA Slots
- Ex-Corporate & refurbished with 3 months warranty
- Upgrade to DVD Drive add £30+VAT (£35.25inc)

ULTRA SLIM LIGHTWEIGHT NOTEBOOK

DELL
LATITUDE C400 SUB NOTEBOOK
£299 +VAT £351.33 inc VAT

- Dell Latitude C400 with Intel PIII-1.2GHz CPU
- 512MB Ram, 20GB Hard Drive, Ext CD ROM Drive and Floppy Drive, 12.1" TFT 1024X768 Res Display
- Parallel, VGA, PCMCIA, USB, Modem & Lan ports
- Dimensions 289 x 239 x 25mm. Weight 1.7Kg.
- Dell factory refurbished stock with 6 months warranty.

HP COMPAQ
PRESARIO P4 2.8GHz 512MB CD-RW+DVD PC
£289 +VAT £339.58 inc VAT

- Compaq Presario SR1224NX. Intel Pentium 4 2.8GHz
- 512MB Ram Upgradeable, 80GB Hard Drive
- CD-RW & DVD Drive, Modem, Lan, USB & Firewire
- Built in 9 in 1 memory card reader, Keyboard & Mouse
- MS Windows XP Home, Works & Anti Virus Software
- HP factory clearance refurb stock with 1 year warranty
- 17" TFT Monitor add 139+VAT (£163.33inc VAT)

HP MEDIA CENTRE
M1150 PHOTOSMART PC DVDRW TV & FM TUNER
£549 +VAT £645.08 inc VAT

- HP Media Centre M1150. Intel P4 2.93GHz CPU
- 512MB DDR RAM, 160GB Hard Drive
- Dual Layer DVD Rewriter Drive, 128MB Graphics
- Modem & Lan, 9 in 1 Memory Card Reader, Built in TV & FM Tuner plus Remote Control & Speaker set
- Wireless Keyboard and Mouse, Microsoft Windows XP Media Centre plus Works Suite and other software
- HP factory clearance refurb stock. 1 year warranty.

ACER N35
POCKET PDA WITH BUILT IN SAT NAV
£189 +VAT £222.08 inc VAT

- Acer N35 PDA with satellite navigation solution
- Includes PDA with built in GPS and local country maps bundled onto a 256MB Card. Easy to use & navigate
- Package includes Acer N35 PDA with 266MHz CPU
- Windows Pocket PC 2003 Software, plus Destinator Voice guidance Sat Nat Software, cables & car kit etc.
- Factory refurbished as new with 1 year warranty.

TOSHIBA
15.4" WIDESCREEN XP PRO WIFI NOTEBOOK
£489 +VAT £574.58 inc VAT

- Toshiba Tecra A4, Intel Celron Mobile 1.5GHz CPU
- 512MB Ram, 60GB HDD, CD-RW+DVD Combo Drive
- 15.4" Widescreen Display, Built in Wireless Network
- Supplied with Microsoft Windows XP Pro Software
- Brand New with 1 year Toshiba International wa
- Notebook Carry Case add £20+VAT (£23.50

ORDER NOW FOR NEXT DAY DELIVERY

DELL
1.2GHz CD-RW+DVD 512MB/30GB NOTEBOOK
£349 +VAT £410.08 inc VAT

- Dell Latitude C610, Intel Pentium III-1.2GHz CPU
- 512MB Ram, 30GB Hard Drive, 14.1" TFT Screen
- CD-RW+DVD Combo,3.5" FDD, Battery & Charger
- Built in 56K Modem and 10/100 Network card
- 2x PCMCIA, Serial, Parallel, IrDA, VGA & USB
- Supplied with Microsoft Windows 2000 Pro So
- Factory refurbished stock with 6 month wa
- Notebook carry case add £20+VAT (£23.50inc

GREAT SPEC

USB INTERNET TELEPHONE
£25 +VAT £29.38 inc VAT

Make free Internet phones calls from your computer to any other computer worldwide via Skype or Netphone. Call any landline phone number worldwide from just over 1.1p per minute. Also have your own landline number on your computer so people can call you from anywhere. Includes USB Phone, Software & instructions

NORTHG
2.2GHz 256MB/40G CD-RW + DVD PC
£199 +VAT £233.83 inc VAT

- Northgate STAC2217 PC. Intel Celeron 2.2GHz CPU
- 256MB Ram, 40GB HDD, 6 in 1 Memory Card Reader
- Serial, Parallel, 6 X USB 2 ports, Audio in/out
- Builit in Modem and Lan, Microsoft Windows XP Home, Norton Antivirus pus DVD & CDRW Software
- Supplied with Keyboard, Mouse & Speakers.

IBM
THINKPAD PIII 800MHz CD-RW NOTEBOOK
£295 +VAT £346.63 inc VAT

- IBM Thinkpad A21M. Intel Pentium III-800MHz CPU
- 512MB Ram, 20GB Hard Drive, 14.1" TFT Display
- Includes CD-RW, Floppy Drive, Battery & Charger
- Built in Modem, Serial, Parallel, VGA & USB Ports
- IBM factory refurbished stock with 6 months warranty.
- Notebook carry case add £20+VAT (£23.50inc VAT)
- Operating System available at extra cost.

COMPUTER BARGAINS

1 STAND LANE, RADCLIFFE, MANCHESTER, M26 1NW.

Mail Order Sales Call: 0161 723 2222
Other Enquires Call: 0870 757 2210
Fax No: 0870 757 2219

Email: sales@computerbargains.co.uk ALL MAJOR CREDIT CARDS, GOVERNMENT & EDUCATIONAL ORDERS ACCEPTED

CALLERS WELCOME TO OUR SHOWROOM
PLEASE PHONE TO CONFIRM AVAILABILITY
OPENING TIMES
MON-FRI 9am-6pm SAT 9am-12pm
or visit our website at
www.computerbargains.co.uk

All Trademarks Acknowledged. E &OE

Professional eCommerce
Dedicated servers
Website hosting
Personalised email
Unlimited broadband

Find it at Fasthosts

Everything you need from the UK's largest web host.
Get online from £2.95 pa

Get one month's free hosting at
fasthosts.co.uk/free
0870 888 3802 OFFER CODE: PCW0305

fasthosts
UK's No.1 web host

Domain names • Web hosting • Dedicated servers • Exchange 2003 email • eCommerce • Broadband • Reseller solution

NAMEHOG

Great Value Hosting Plans

Main Features	Standard	Professional	Expert
Web Space	100Mb	250Mb	500Mb
Monthly Bandwith	4.5Gb	8.0Gb	15Gb
Mailboxes	10	25	75
Mail Aliases	Unlimited	Unlimited	Unlimited
Domains	Unlimited	Unlimited	Unlimited
Sub Domains	0	5	50
MySQL Databases	0	3	10
POP/IMAP/Webmail	✓	✓	✓
Perl/PHP/Python	✓	✓	✓
FrontPage Support	✓	✓	✓
Cpanel Control Panel	✓	✓	✓
all prices are plus VAT @ 17.5%	£2.50 Per Month	£4.17 Per Month	£7.50 Per Month

Call Now On: 08456 120 330

Affordable Internet Solutions
http://www.namehog.net

DELL
LAPTOP PARTS
www.laptopPARTS.co.uk

MEMORY - 144/200pin SO DIMM

1GB/512mb Dell Inspiron 8500/8600	£78/45
256/128mb SonyVAIO PCG-FX series	£49/29
256/128mb Compaq Presario/Armada	£47/31
256/128mb IBM ThinkPad series	£49/33
512/256MB DDR266 PC2700 200pin	£49/31
1GB PC3200 (400) DDR 200pin laptop	£75
512/256MB - PC 133 SODIMM	£79/49
256/128MB - PC 100 SODIMM	£53/29
Secure Digital (SD) 1GB Memory card	£39.95
1GB COMPACT FLASH CARD RETAIL	£37.95
Portable USB 2 Pen Drive 512MB Retail	£24.95
Portable USB 2 Pen Drive 1 GB Retail	£37.95
6-in-One Card Reader Alu Ext USB2	£12.00
TRANSFER/BACKUP 30Gb USB2 XXT HDD	£59.95
Matched Memory for Compaq/IBM/Toshiba/DELL	

NOTEBOOKS / LAPTOPS

ASUS A3 15" TFT Intel Cel-M 360 1.5GHz 512MB 40GB CDRW/DVD Wireless 802.11g XP PRO 2yr war £458

ASUS A6712ULH 15.4 TFT WIDESCREEN AMD SEM 3000 64Mb GRAP 512MB 60GB DVDRW WLAN XP £469

ASUS A4780GLH 15.4 TFT W/SCREEN INTEL P4538 3.2GHZ ATI Rad 9700 60GB 512MB DVDRW WLAN XP £645

HP NX6125 AMD Turion 64 ML28 1.6GHz PCI-X ATI RAD X300 G 512MB 80GB 15" DVD±RW WLAN XP Pro £425

Acer Aspire 5001LM, 15" XGA, AMD Turion ML28 1.6GHz, 64MB graphics 512B, 60GB, DVD RWWLAN XP £489

Sony Vaio FS215B Centrino T40 1.73GHz 60GB 512MB 15.4" X-black LC 100GB DVD±RW WLAN XPH £719

Toshiba Satellite Pro L10 Celeron-M 370 1.5GHz 40GB 256MB 15" WLAN CD-RW/DVD mdm/lan XP Pro £455

Fujitsu Siemens Amilo D 1845 P4 532 3.06GHz 256MB 40GB DVD-RW WLAN XP 3 USB2, frwire a-vid £699

Toshiba Sat-pro 4600 P3-700 256mb 20gb CD FDD 14" TFT 56k-10/100 /wireless with Win 2K COA £299

HP OmniBook 6000 INTEL P3 700 MHz 256Mb 20Gb 14.1" TFT DVD-ROM COA Windows 2000 Prof £249

Dell C400 intel P3 1.2Ghz 512MB 40GB Ultra Light CDRW/DVD 12.1 TFT USB, Modem, 10/100 LAN £255

For the full range of Notebooks CALL US

Notebook 2.5" HARD DRIVES

Fujitsu 20/30gb 2.5" 4200rpm ATA100	£49.00/£55.00
Fujitsu 40/60gb 2.5" 4200rpm ATA100	£69.00/£79.00
Acer Aspire/Tmate HDD 20/30/40gb	£55/65/75
HP OmniBook XE/2/3 20/30/40gb	£49/69/79
IBM Thinkpad Series 20/30/40gb	£49/67/79
Compaq Presario+Armada 20/30/40gb HDD	£49/66/77
Dell Latitude/Inspiron 20/30/40gb HDD	£48/64/79
Toshiba Satellite+Pro 20/30/40gb HDD	£49/61/77
SONY VAIO PCG harddisk 20/30/40gb	£55/65/89

Online HDD Configurator SEE WEB SITE

Modems / Networking / CDRW

56.6K PCMCIA modem for Laptops	£29.00
USB Flexi-Neck Notebook Light USB Powered	£4.99
PCMCIA EXTRA 2 port USB2.0 controller	£19.99
Targus Carry Cas Black Nylon	£14.95
USB Bluetooth Dongle communicate wirelessly	£18.00
Asus Ultra Slim CDRW/DVD Ext USB 2.0/Firewire	£89
Targus USB2 Port Replicator W/10/100 Enet Audio	£85
DVD Rewriter Léon D/Layer Ext USB2 DVD+/-RW	£75
Portable 2.5" HDD External Case USB2.0/1.1	£25.00
Xircom Realport 56K/10-100 PCMCIA Modem	£34.95
Compaq M300/M700 Series 8 X DVD Rom	£44.95

DELL LAPTOP PARTS

Dell Latitude D series DVD REWRITWR	£99
Dell Latitude & Inspiron CDRW + DVD Combo	£85
Dell Latitude & Inspiron CD/DVD/CDRW	£39/59/59
Dell Latitude & Inspiron Floppy Drive	£25.00
Dell Latitude BATTERY / AC ADAPTER	£55/39
Dell Inspiron BATTERY / AC ADAPTER	£52/35
Dell Latitude & Inspiron UK Keyboard	£79.00
Dell D Series D-Bay USB 2 Caddy	£39.00
DELL Hard drive Caddy Main/2nd	£33.00/52.00

DELL SCREENS / DELL MAINBOARDS CALL

• Select Memory for All Makes & Models • LIFETIME WARRANTY On all Modules
• FREE Technical Support • FREE DELIVERY on all memory orders - quote What Laptop
• WE ALSO OFFER: • Laptop Batteries • Laptop Mains / AC adapters • Laptop Car Cords

SUPPLIERS OF LAPTOP PARTS FOR ALL MAJOR BRANDS
SALES: 0870 027 6115
sales@laptopparts.co.uk
Prices Ex VAT @17.5% / Subject to change
SECURE 24HR ONLINE ORDERING

UK'S BEST VALUE
Domain Registration

.co.uk £3.95 per year
.com £9.95 per year

- No hidden charges and simple pricing policy
- Unlimited telephone support when you need help
- Advanced control panel to manage your domains
- Register online now at www.redstation.com

PLUS get this web hosting account free with every domain!

- 1GB webspace
- Advanced Control Panel
- Unlimited Email accounts
- Webmail Interface
- ASP.NET Framework
- ActivePerl 5
- CGI-bin & SSI enabled
- Jmail Professional & AspEmail
- Preview URL
- FTP account
- Custom 404 Error Page
- Spam Filtering
- Real-time AntiVirus Protection
- Unlimited Technical Support

All prices plus VAT. Redstation Internet Limited is a member of Nominet UK.

Call 01329 828224
or visit www.redstation.com

redstation
established 1998

Order online at www.offtek.co.uk
and take Advantage of FREE UK Delivery!

offtek .co.uk

Notebook Memory

Prices from	64MB	128MB	256MB	512MB
	£19	£19	£21	£42

Desktop Memory

Prices from	32MB	64MB	128MB	256MB	512MB
72 Pin Simms	£20	£57	£129		
168 Pin Dimms	£14	£15	£24	£41	£63
184 Pin DDR Dimms			£16	£20	£35
Rambus Rimms			£31	£59	£166

Workstation/Server Memory

Dell PowerEdge, Sun Enterprise, Compaq Proliant, IBM Netfinity, HP Netserver & many more!
For prices and available upgrades please visit our website at: www.offtek.co.uk or call our Freephone Salesline

Flash Memory

Prices from	32MB	64MB	128MB	256MB
Compact Flash	£15	£16	£16	£19
Smartmedia	£13	£15	£19	
Multimedia	£13	£14	£17	£23
Secure Digital Card	£14	£15	£17	£22
Memory Sticks		£18	£23	£31

Also, USB based card readers for all types of cards from £24.00

Free UK delivery for online orders!
Over 30,000 memory products for Desktops, Notebooks, Printers, Servers, Workstations, MP3 Players, Network Routers, Handheld PC's Digital Cameras, and much more...

Apple COMPAQ IBM AST TOSHIBA
EPSON Canon HEWLETT PACKARD DELL SONY

Memory for virtually all makes and models!
Installation guides and memory faq's available online at www.offtek.co.uk

Need extra income? Earn commission selling OFFTEK products. See our website for details.

- ✓All OFFTEK memory carries a lifetime warranty and is guaranteed 100% compatible.
- ✓All OFFTEK memory is manufactured using Premium brand chips which ensures the highest level of reliability and compatibility.
- ✓Our large stock holding ensures that the majority of our products are held in stock.
- ✓Free telephone support with identifying and installing your memory.
- ✓Official orders are welcome from plc's, government and educational establishments.

Freephone
0800 698 4100

Tel: 0121 722 3993 Fax: 0121 743 9845
Brymar House, Walford Drive, Solihull, West Midlands, B92 9DW.
All Trademarks & Registered Trademarks acknowledged.
Prices subject to change without notice.
E & OE. Prices ex VAT. P&P £5.00

VISA

No surcharge on Credit or Debit Cards.

Print-Rite
Quality Earlier Non-Chipped Epson Compatibles
Black £1.29 Colour £1.95

Print-Rite R-200/300/RX500/600 £1.95
Budget R-200/300 RX-500/600 £1.49
Print-Rite RX-420/425 £2.49 (Budget £1.95)
Print-Rite CX-3600/3650 £2.49 (Budget £1.95)
Print-RiteC64/C66/C84/C86 £2.49 (Budget £1.95)

HP Compatibles
51645/C6615 42ml black £7.95
C6578 39ml colour £9.95
C1823 39ml colour £10.95
C6625 39ml colour £10.95
51641 39ml colour £10.95

Print-Rite
Quality Chipped Epson Compatibles
Black £1.95 Colour £2.49

Quality Budget
Chipped Epson Compatibles
Black £1.75 Colour £1.95

Canon Compatibles
BCI-24 black £1.29 BCI-24 colour £1.49
BCI-3 & 6 compatible £1.49 per cartridge
BC-20 & BX-20 black compatible £10.95
BX-2 & BX-3 black compatible £10.95

Lexmark, HP, Brother, Philips @ Low Prices
+ Ink Film for faxes

Photo Paper

6 x 4 Photo Matt 190gsm 100 sheets £5.95
6 x 4 Photo Gloss 210gsm 100 sheets £9.95
7 x 5 Photo Matt 190gsm 100 sheets £8.95
7 x 5 Photo Gloss 210gsm 100 sheets £11.95
100mm x 10m Roll Photo Gloss 259gsm £14.95
100mm x 10m Roll Photo Silk 259gsm £14.95
A4 Photo Gloss 210gsm 20 sheets £5.69
A4 Photo Gloss 260gsm 20 sheets £5.95
A4 Photo Matt 100gsm 100 sheets £4.49
A4 Photo Matt 120gsm 100 sheets £5.95

Energiser / Fameart Digital camera 2A power adaptor. With a set of 16 plugs Only £12.95

Also available, switch mode power supplies with a set of 16 plugs. Voltage output 3v, 4.5, 5v, 6v, 9v & 12v
800ma output £11.95.
1000ma output £12.95

10hr Battery charger with 4 x 2300mah NiMh AA batteries £9.95
(With 4x2000mah) £7.95
Just the charger £5.95

64 minute charger with 4 x 2300mah AA batteries £18.95

NiMh Batteries
2300mah AA £5.95
2500mah AA £7.95
800mah AAA £5.95

Lithium CR-2016, CR-2025, CR-2032 59p
CR-123 £1.79 CR-2 £1.79 CR-5 & CRP2P £2.95

Digital Memory Cards

Please note, these prices can change frequently without notice. Please see our website for latest prices

Compact Flash (20x speed) 128MB £11.95 256MB £15.95 512MB £26.95 1GB £46.95
SD cards (20x speed) 128MB £11.95 256MB £16.95 512MB £25.95 1GB £49.95
Mini SD Cards 128MB £16.50 256MB £22.50 512MB £34.95
XD Cards 64MB £12.95 128MB £17.50 256MB £25.95 512MB £43.95
Memory Stick (standard) 64MB £13.95 128MB £21.50 256MB £29.95
Memory Stick Duo 128MB £33.95
Memory Stick Pro Duo 128MB £24.50 256MB £30.95, 512MB £42.95 1GB £79.95
USB-2 High Speed Flash Drives 128MB £11.95 256MB £16.95 512MB £26.95

All Company, product and brand names listed are the property of their respective holders and are used only for descriptive purposes

Prices include VAT
Free UK delivery on orders £10 and over
(For orders under £10, its just £1 p&p)

www.tonezoneuk.com
Tel. 0870 800 1 800
Fax. 0870 800 2 800

ToneZone Consumables
Callers Welcome

8 - 10 Littlehampton Road
"Thomas-a-Becket", Worthing
West Sussex, BN13 1QE

Personal Computer World

Reader Offers

An exclusive deal for PCW readers...

CREATIVE LABS ZEN MICRO MP3 PLAYER

- Micro-sized – 8.4 x 5.1cm • 12-hour battery life
- 5GB of disk space • Removable, rechargeable battery • FM radio • Vertical touchpad • Voice and FM radio recording • Address book, calendar and more • Store up to 2,500 songs • Transfer any data between computers – use as a removable hard drive

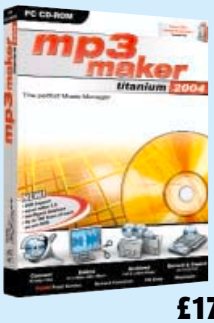
ONLY £159

This micro-sized mp3 player, reviewed in *PCW* March, has a massive 5GB of memory and stacks of other great features. The memory can store around 2,500 songs, while the battery lasts for 12 hours and is rechargeable and removable. Weighing only 108g and just 1.9cm deep, the Zen Micro is one of the smallest mp3 players around. It also features an intuitive vertical touchpad, which makes it straightforward to navigate around your music and data.

The Zen Micro is compatible with wav, wma and mp3, and has an FM radio (from which you can record) and a digital voice recorder. It includes a calendar, address book and to-do list which will sync with Microsoft Outlook. This small mp3 player/radio/voice recorder/organiser offers all the appeal of the Ipod mini, but with wma compatibility and more memory and features. Select your colour from: silver, light blue, dark blue, purple, black, white, pink, red, orange or green.

BUY THE ZEN MICRO AND GET MP3 MAKER FREE

Burn CDs and DVDs, categorise and archive mp3s, convert and edit music files and mix playlists. Mp3 Maker converts CD tracks into mp3s and back again, and supports all popular formats. It has a music catalogue that finds and saves every song on the PC in categories – automatically and intelligently – and it records from all external sources, including Internet radio.



Please quote order code Z254

RRP **£179**

SPECIAL READER PRICE **£159**

HOW TO ORDER

ONLINE
via our secure website
www.direct-pcw.co.uk

PHONE
0870 830 4973

For a wider selection of discounted products, visit: www.direct-pcw.co.uk

Business Services

CD/DVD SERVICES

Contact Digital Data for full details on all aspects of: Short run duplication, Thermal Printing, Screen printing, Credit Card CDs, Design, Pressing, Packaging, Printers and Duplicators.

DVD/CD DUPLICATION:
Rapid turnaround on high quality CD-R & DVD-R colour thermal printing & duplication. No minimum quantities. Screen printing, pressing & fulfillment also available.
Everest thermal printer ribbons at competitive prices.

DUPLICATORS:
CD & DVD tower duplicators available: from a 3 burner 52 speed CD unit at £389 to a 16 speed 7 burner DVD unit at £779. See our website for specifications & full pricing information.

ADOBE ACROBAT:
We are expert at converting your existing paper and electronic material to Acrobat format, ask for a free sample conversion of your data.

Digital Data Ltd

T: 01732-460421
E: sales@d-data.co.uk
sooner or later you need digital data
F: 01732-740992
W: www.d-data.co.uk

Consumables

Finest Quality
EPSON
Compatible Ink Cartridges

As **Epson specialists**, we only stock **brand new** ink cartridges - **not** recycled or refilled cartridges. All come with a full **100% money-back** guarantee!

Epson Stylus *C42, C44, C60, C62 680, 790, 810, 830, 870, 890, 900 915, 925, 935, 1290, CX3200, etc*
3xBlack: **£7.99** 3xColour: **£9.99**

Epson Stylus *C20, C40, 400, 440 460, 480, 580, 600, 640, 660, 670 700, 740, 750, 760, 800, 880, etc*
3xBlack: **£4.99** 3xColour: **£7.99**

Epson Stylus *C64, C66, C70, C80 C82, C84, C86, CX5200, CX5400 etc*
Full set of all 4 cartridges: **£11.99**

Epson Stylus Photo *R200, R300 R300M, RX500, RX600, RX600, etc*
Full set of all 6 cartridges: **£15.99**

www.Britink.co.uk
0800 1075 270
• VAT included • P&P 99p per order • No Minimum Order •

Consumables

www.supplylineuk.com

The best range of printer consumables available today!

The lowest prices in the UK! GUARANTEED!

Massive Stocks Instant delivery

OFFER OF THE MONTH!

DELL A720 and 920 Cartridges
1x BLACK & 1x COLOUR FOR ONLY
£24.95
Remanufactured
OFFER ENDS 31/08/05
INCLUDING VAT AND DELIVERY!

SupplyLINE
TEL: 0870 7654012

ISPS

Abel Internet

Free ADSL migration to Abel
Competitive Prices
Broadband ADSL Packages
Free Subscription & Unmetered Internet Packages

- Generate Extra Income
- Create Client Loyalty
- Become an ISP
- Reseller Packages
- Server Co-location
- Domain Registation & Hosting

Visit: www.abelvisp.co.uk www.abelbiz.info

0871 717 8252
www.abelgratis.co.uk
Or sign up NOW by going to:
FREE Software on Cover CD

Laptop Repair Services

Laptop Repair Specialists

Notebook • Laptops
we buy faulty and second user laptops for cash

- Sony Vaio
- Toshiba
- Compaq
- Advent
- Acer
- Hewlett Packard
- Packard Bell
- Samsung

ACCENT
Unit 20 Wassage Way Hampton Lovett Industrial Estate Droitwich Worcs WR9 0NX
COLLECTION AVAILABLE NATIONWIDE
0870 3005019
01905 796560

Notebooks

WWW.LAPTOPSPARES.COM

SALES@LAPTOPSPARES.COM
- ALL LAPTOP AC ADAPTORS
- ALL LAPTOP BATTERIES
- ALL KEYBOARDS, FDD DRIVES
- LAPTOP RAM, HARDDRIVES
- CD ROMS, SCREENS, PLASTIC INCLUDING TINY, DELL, AJP, HP, PICO, CLEVO, TOSHIBA, DELTA, SONY, IBM, FUJITSU, ACER, MESH AND OTHERS

WWW.DESKTOPSPARES.COM

SALES@PHONESPARES.CO.UK
- ALL MOBILE PHONE BATTERIES
- ALL IN CAR PHONE CHARGERS
- WIRELESS HEADSETS, HANDSETS
- ALL HANDS FREE KITS, CORDS

Please Call 0870 7773015

Parental Controls

SURFSAFE.CO.UK

SURFSAFE.CO.UK is easy to install and set up
Your PC will be protected in minutes
You decide what gets blocked
See what web sites your children visit
Helpdesk support based in the UK
SURFSAFE.CO.UK works with any ISP
Tiscali, Wanadoo, Yahoo...
works with windows XP and 2000
SURFSAFE.CO.UK only £2.99 per month
14 day money back gurantee

Keeping your kids safe online

CD-RMedia.co.uk
maxell
Official Distributor

Maxell
CD-R 80min
700MB
52x Speed
Spindle of 100
Only 12p per disc

Maxell
DVD+R
Double Layer
2.4x Speed - Jewel Cased
Only £3.99 per disc

Maxell
DVD -/+ R
4.7GB 8x Speed
Spindle of 25
Only 26p per disc

Tel. 0845 230 4455

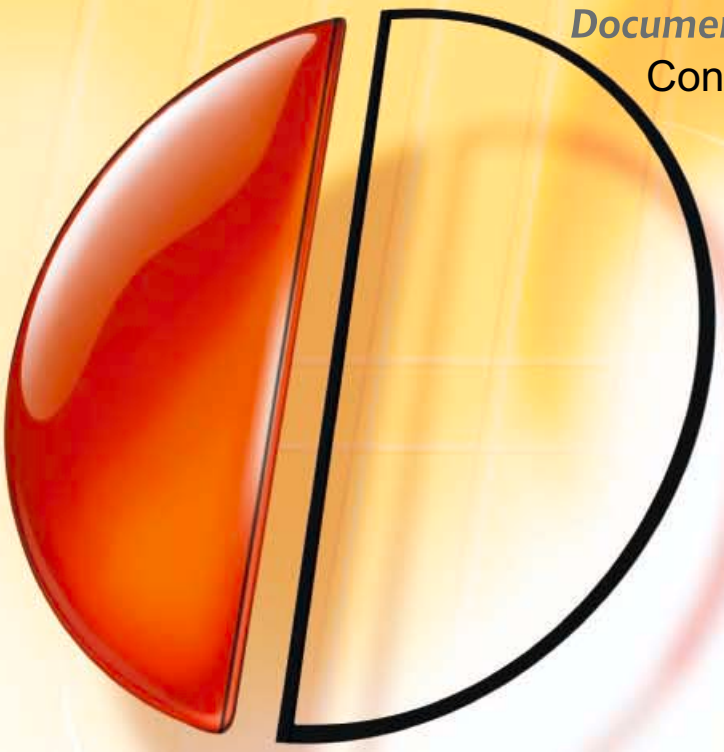
Order via the web for Special Offer
Promo code: MAX-PCW for 200 FREE MEDIA POINTS
visit us on the web www.cd-rmedia.co.uk

COMPUTER SYSTEMS ODESSA

ConceptDraw LINE

www.conceptdraw.com

FLOWCHARTING · IDEAS MAPPING · PROJECT MANAGEMENT · BUSINESS PHOTO REPORTS



Document your business practice
ConceptDraw **REPORTER**

Manage multiple projects
ConceptDraw **PROJECT**

Create business and technical diagrams
ConceptDraw V

Brainstorm and map your ideas
ConceptDraw**MINDMAP**

Cross platform

PC/Mac compatible

Extended export/import capabilities

Task-special wizards

Free and unlimited technical support

5% OFF VOUCHER

Go to www.conceptdraw.com/pcworld and enter your voucher code.

Visit www.conceptdraw.com for a free trial and more information

Voucher code:
pcw1749

ANTI-SPYWARE SOFTWARE Protect your PC with the latest packages – see page 85

INKJET PHOTO PAPER Turn to page 99 to see if third-party paper is a false economy

COVER DISC

ON THE CD

Genie Backup Manager 6 Personal ● Cyberlink Power2Go 4 VCD ● E-txt msg manager 4 ● Serif Pageplus 7 ● BB Flashback Express 1.4.5

ON THE DVD

Roxio Recordnow Deluxe 7 LE ● Gentoo 2005.1 ● Mandriva 2006 Beta 3 ● Genie Backup Manager 6 Personal ● Cyberlink Power2Go 4 VCD ● E-txt msg manager 4 ● Serif Pageplus 7 ● BB Flashback Express 1.4.5

SOFTWARE LISTING

ON THE CD

FULL VERSIONS
Genie Backup Manager 6 Personal
Cyberlink Power2Go 4 VCD
E-txt msg manager 4
Serif Pageplus 7
BB Flashback Express 1.4.5

TRIAL VERSIONS
BB Flashback
Genie Backup Manager Pro 6
Paragon Drivebackup 7
Remote Command Personal Edition
Zone Alarm Internet Security Suite 6

FREEWARE INCLUDING
3d Traceroute 2.1.0.5
Cryptainer LE 6.0.1
Google Earth 3.0.0395 beta
Mail Enable Standard 1.9
Safe XP 1.5.7.14

RESOURCES INCLUDING
Audacity 1.23
CD Burner XP 3.5.101.4
Free Download Manager 1.9
Google Talk 1.0.0.64 beta
Mozilla Firefox 1.06
Mozilla Thunderbird 1.06
Opera 8.02
Picasa 2
Skype 1.3.0.66
Startup Inspector 2.2

ON THE DVD

EVERYTHING ON THE CD PLUS...

FULL VERSIONS
Roxio Recordnow Deluxe 7 LE

TRIAL VERSIONS
Paragon Partition Manager 7

LINUX AND OPEN SOURCE
Gentoo 2005.1
Mandriva 2006 Beta 3

RESOURCES
Adobe Reader 7
Openoffice 2 beta 2

FROM THE MAGAZINE
Inkjet scans from our group test on page 90
Ad-Aware SE Personal Edition
Bulletproof Spyware Remover
Frontview for Windows Media Center Edition
Noadware
Norton Internet Security Antispyware Edition
Spybot – Search & Destroy
Spyware Doctor 3.2
Spyware Eliminator 4
Virtualdub 1.6.10
Virualdub Mpeg-2

GAME DEMOS

USING THE COVER DISC

The PCW cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so that you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

STARTING THE DISC

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer, or open the terms.htm file on the root of the disc.

PROBLEMS?

Please note that we cannot give support on individual programs contained on this disc. If you have problems running the disc or any of its content, please note these guidelines:

FAULTY DISC
If the disc is physically damaged and will not load, return it to this address for a replacement:
PCW November 2005, cover disc
ABT, 306 St Mary's Lane, Upminster, Essex RM14 3HL quoting reference: 'PCW Vol 28 No 11'.

PROBLEMS INSTALLING/ RUNNING THE SOFTWARE
Check the support page on the disc, or check the manufacturer's site.

GENERAL DIFFICULTIES
Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat).
Or go to www.vnusupport.co.uk or email us at pcw@vnusupport.co.uk.

SIX PAGES OF DISC INFO INCLUDING

- PRODUCT DESCRIPTIONS
- WORKSHOPS
- UPGRADE OFFERS
- KEY FEATURES
- CONTACT DETAILS
- NEED TO KNOW

Genie Backup Manager 6

Protect your valuable files from disaster with this Personal edition

INFORMATION

System requirements 128MB of Ram, Windows NT4 SP6/2000/XP, Internet Explorer 5 or later, 20MB of free disk space

Contact www.genie-soft.com

Registration Not required

Traditional file-based backup tools are not always easy to use. Would you know how to back up an installation of Dreamweaver MX, for instance? It is easy enough to find the relevant Program Files folder but does the program also install files in your Application Data folder or in Windows? And what about any Registry settings it requires?

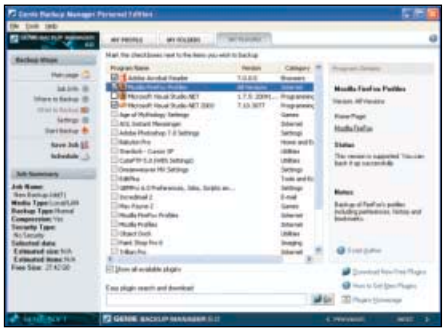
Figuring out all this yourself can be a nightmare, which is why Genie Backup Manager takes an entirely different approach. The program comes with a long list of plug-ins, each containing all the information necessary to back up a particular application; all you have to do to enable this is click on one box.

Have you found there is no plug-in for one of your most important applications? Then you have a couple of possible solutions. One option is to enter the name of your program in the 'Easy plugin search and download' box and click on Go. Genie Backup Manager will search for matching plug-ins online and display the results in a browser window. If you are in luck and it finds something, click on Download and the plug-in will immediately be installed, ready to use.

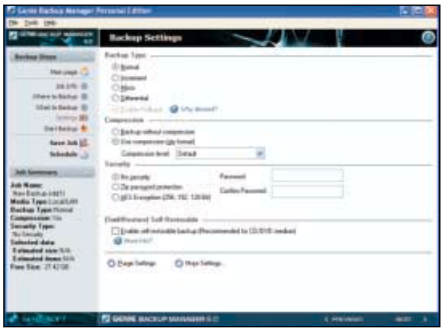
If there is no plug-in to suit your needs, you could always try creating one yourself. Plug-ins are written in an XML-based scripting language called Geniescript, where you specify the Registry keys, files, folders and .ini file entries you would like the program to back up. It is not difficult to follow and by looking through the bundled example scripts, you will soon be able to write new plug-ins of your own.

Begin backing up your most important files in under 60 seconds

1 Running backups is a tedious operation at the best of times, but at least Genie Backup Manager keeps the hassle to a minimum. After loading the program, click on Backup, enter a backup job name and click on Next. Choose either a local or network drive or remote FTP server as the backup location and click on Next again.



2 Click on Next and check the boxes next to the system items you want to back up (Registry, your favourites, Windows Address Book, Outlook and Outlook Express mail and so on). Select the Plug-ins tab and look for any other applications you would also like to save, then finally add your choice of files and folders under My Folders.



3 Click on Next and choose your backup settings from a list including backup type (normal, incremental, mirror, differential), compression, security (none, zip password, AES) and so on, then click on Next > Backup Now to initiate the backup job. Or use the Scheduler to run that job overnight or some other time when you are not around.

UPGRADE OFFER

GENIE BACKUP MANAGER PRO

NEW FEATURES

Back up to multiple disks
Network backup
Enhanced encryption
Back up media playlists

The Pro version of Genie Backup Manager includes extras such as the ability to save your backup to multiple disks (floppies, Zip disks), CD or DVD, tape or FTP files of unlimited size. Encryption choices are extended with 196- and 256bit options and you will gain the ability to create Outlook profiles and back up media playlists.

The list price for Genie Backup Manager Pro is $69.95 (about £42), but you can upgrade for only $35 (£21).

Go to www.regsoft.net/purchase.php3?productid=68940&pc=y62D1 to order.

FULL VERSION

Serif Pageplus 7

This is the ideal tool with which to unleash your creativity

INFORMATION

System requirements Windows 98 or later, 90MB of free disk space

Contact www.serif.com

Registration Follow the Registration Wizard when launching the program

It is 15 years since Pageplus 1 first brought desktop publishing to the masses, and there is plenty to like about version 7.

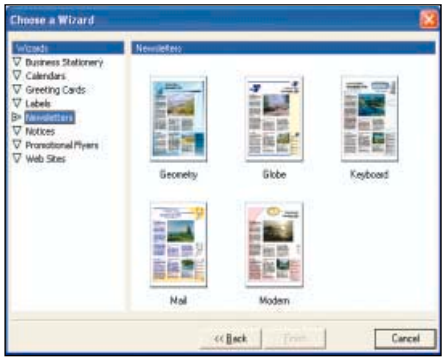
If you are artistically challenged, for instance, you will appreciate the prebuilt templates, including business cards, calendars, greetings cards, CD and DVD labels, newsletters and even web pages. Each design is complete, so all you need to do is customise them with your own text, then print the finished results.

If you cannot find a template you like, start with a blank page and then build a design that precisely suits your needs – and that does not have to be difficult, either. The Portfolio tab conceals a range of backgrounds, logos, text effects, masks and other components, all ready to drag and drop into place.

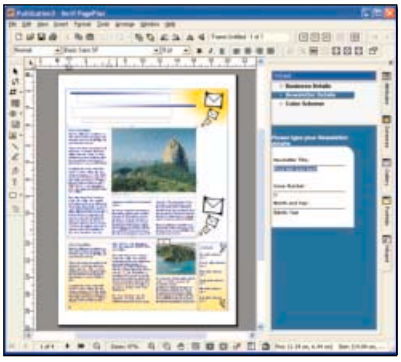
If you are an old hand at desktop publishing, all this handholding will not seem too important, though. You will be more interested in features such as text handling, automatic superscripts and subscripts and ultra-high precision (0.1mm) for formatting and positioning. The Text Frames feature which is new to this version makes it easy to rotate the text to any angle or wrap it around photos, graphics and other objects. And the maximum zoom value of 5,000 per cent ensures pinpoint accuracy of all your page components.

Add the graduated fills, transparency effects, enhanced line drawing and professional printing options and it is clear that Pageplus is not just for beginners. There really is something here for everyone.

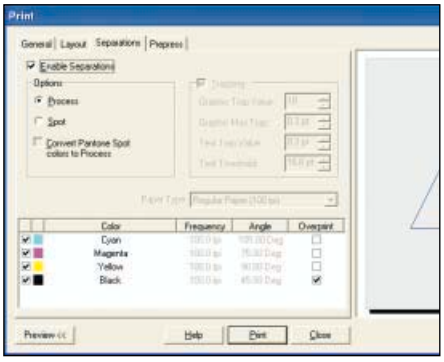
Create your own newsletter with less hassle



1 **Do you want to see your name in print? Creating a newsletter for your neighbourhood, company or club is one route and Pageplus 7 makes the whole process very easy. Launch the program, click on 'Use a Page Wizard' on the Startup page, then select the Newsletters section and choose a template you like.**



2 **Click on Finish, then customise the documents by following each step in the right-hand wizard dialogue. You will get to enter details such as your newsletter name, issue number, date and colour scheme. Finally, choose one of the co-ordinated colour schemes on offer and click on Finish to begin the editing process.**



3 **Right-click on a block of text, select Edit Story, then replace the default text with your copy and use the buttons at the bottom right of the screen to do the same on the other pages. Click on File > Print when you have finished and explore the excellent layout, separations and prepress print options on offer.**

UPGRADE OFFER

PAGEPLUS 10

NEW FEATURES

Bookplus to create your own books based on multiple Pageplus documents
Unicode support
ODBC mail and photo merge (to documents)
Find and Replace

The latest Pageplus includes a Bookplus feature, which combines multiple Pageplus files into a single co-ordinated document (even down to common page numbers). There is full Unicode support, ADO and ODBC-based mail and photo merge and a Find and Replace feature that can search for text, text attributes, fonts, colours and more.

PCW readers can upgrade and receive a program CD, additional resource CD and manual for only £79.99, a saving of £20 from the list price. To upgrade call 0800 376 7070 quoting code: RO/PCW/PP7/0905. Offer expires on 22 October 2005.

BB Flashback Express 1.4.5

Create crystal-clear movies of just about any PC screen activity

If you need to create presentations, build slideshows or design software tutorials, the BB Flashback Express recorder may be able to help. It records what is happening on your whole screen or just a small area, then exports the results as a movie you can share with others.

The market is awash with screen recorder products that can do more or less the same thing, but they often do not have all the extras you will find here. For example, BB Flashback Express uses the absolute minimum of system resources while recording – so you are much less likely to get dropped frames – and uses the highly compressed FBR format, saving crystal-clear movies into the smallest possible files.

This program does not just record images, either. Mouse clicks and key presses can be highlighted to make sure the viewer knows exactly what you are doing. You can also record audio – everything from sounds played by your applications to a full spoken commentary.

After reviewing the movie with the built-in BB Flashback Express Player, you can export it in avi or swf formats, ready to share online with friends. And once again there is no shortage of tweaks to help you get the best possible results. There are options to scale down the movie or lower the frame rate to reduce file sizes, for example. An Autoscroll feature lets you display only a portion of the screen and have it scroll to follow the mouse cursor.

The Flash export option has a customisable HTML template, ensuring the finished movie can match the look and feel of your site.

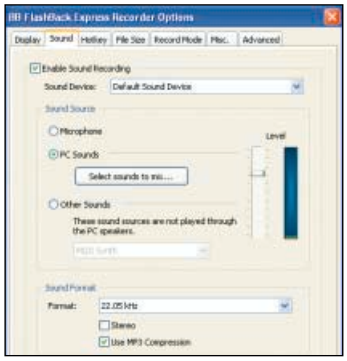
INFORMATION

System requirements 600MHz Pentium CPU, 128MB of Ram, Windows 98 or later, 16MB of free disk space

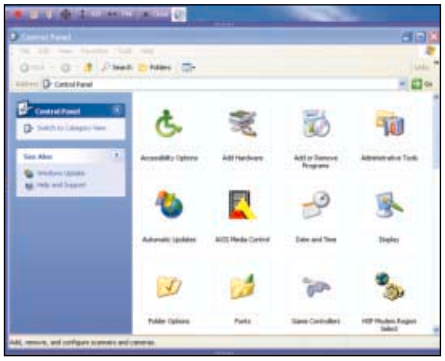
Contact www.bbsoftware.co.uk

Registration Follow the instructions displayed when launching the program

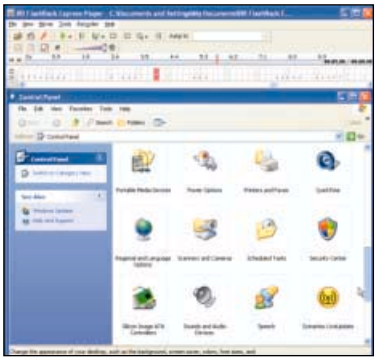
Make desktop movies with BB Flashback Express



1 BB Flashback Express has plenty of interesting configuration options. Would you like to add a commentary to your movie, for instance? Right-click on its System Tray icon, choose Options > Sound, then check 'Enable Sound Recording'. Talk into your microphone to make sure the sound levels are correct, then click on OK.



2 Open the application you would like to report (we are producing a Control Panel tutorial), then right-click on the System Tray icon and choose Record. We are only recording part of the screen, so select the Region option, click on Continue, then drag and drop the target icon onto the title bar of the window to record.



3 Click on Record to begin recording, then follow whatever steps you would like to be recorded in the movie. Click on Record again to stop and choose to play the movie when you are asked. Browse through the timeline to see if you have captured everything correctly and click on File > Export when you are ready to share it.

UPGRADE OFFER

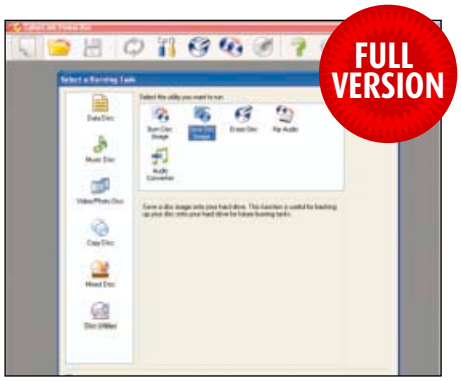
BB FLASHBACK

NEW FEATURES

Edit movies
Add annotations
Add textboxes to recordings
Export as a standalone application
Export as a Powerpoint file

BB Flashback takes the recording abilities of Express and adds its own movie editor. This lets you insert or delete frames, cut or paste footage, add textboxes, and annotations and more. Then when you have finished, export the movie to standalone exe, wmv or Microsoft Powerpoint formats. Buying the program would normally cost £116.33, but as a registered owner of Flashback Express you will only pay £94. Follow the Buy Now > Upgrade link at www.bbsoftware.co.uk to buy the program.

Cyberlink Power2Go 4 VCD



INFORMATION

System requirements 800MHz Pentium III CPU, 256MB of Ram, Windows 98SE or later, 1GB temporary hard drive space for making VCDs
Contact www.gocyberlink.com
Registration Obtain your CD key from www.gocyberlink.com/english/bundle/index.jsp?nEventID=135 before 1 November 2005
Need to know VCD mpeg-1 only

Easy to use need not mean short on features – Power2Go is crammed with CD mastering functions

POWER2GO is Cyberlink's entry in the CD mastering world, and at first glance it looks much like the competition. Spend a little time using the program though, and it is hard not to be impressed. You could just copy some files to CD, for instance, but there is also an option to make the disc bootable, either from an image file you specify or a bootable floppy disk. You could also make an auto-run CD or change the disc icon, in a couple of mouse clicks.

There are plenty of audio CD features, too. You get CD text support for audio CDs and automatically generated playlists for mp3 and wma CDs. There are options to copy audio CDs to your hard drive in a variety of formats, and you can convert files to or from mp3, wma or wav or convert an audio file to a different quality.

A Video/Photo Disc section is ideal for creating video CDs. These can be used to share your home movies or create photo slideshows. VCD resolution is not great at 352 x 240, but you can squeeze a lot onto a CD and the results are viewable on most standalone DVD players.

Also included is the ability to copy discs, create mixed discs or burn or save images. Even as a CD-only version, this is well worth a look.

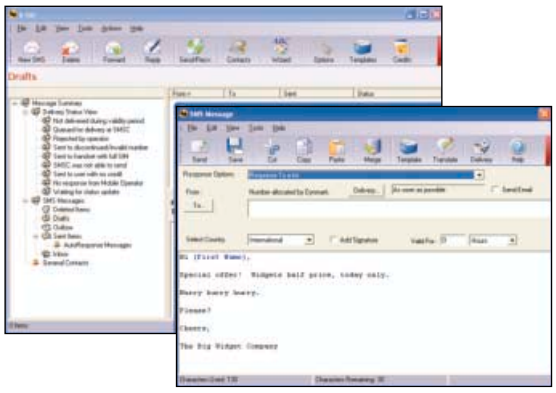
UPGRADE OFFER POWER2GO 4 RETAIL VERSION

The standard version of Power2Go offers support for writing DVDs which means you will be able to save your movies to disc in DVD format. And if that is not enough space, use the new Smart Fit option, which intelligently tweaks video quality to squeeze in all the files you need. Visit www.gocyberlink.com/english/bundle/index.jsp?nEventID=1354 to upgrade for $39.95 (about £24).

NEW FEATURES

Disc Smart Fit option
Mpeg-2 support
DVD burning support so you can back up or store data on a blank DVD

E-txt Msg Manager 4.5.2



INFORMATION

System requirements 64MB of Ram, Windows 2000/XP, 150MB of free disk space
Contact www.e-txt.co.uk
Registration Follow the Click Here link in the Program Activation Wizard
Limitations Includes credits for 30 free SMS messages

Set up your messages so that no replies are allowed or have responses directed to your PC or a mobile

ARE YOU still using email as the main way to communicate with your customers? If so, it is not always a good idea. Marketing emails are often swallowed up by spam filters, for instance, and even if your message does get through, there is no telling when it might be read.

E-txt Msg Manager offers a different approach. It has many of the features you would expect in an email client – message templates, filters, mail-merge fields – but sends and receives SMS text messages instead.

This near-instant communication opens up many interesting possibilities. If you need to remind someone of an appointment, schedule E-txt to send them an SMS message a couple of hours beforehand. If business is slow, create an instant special offer, send it out by text and you could be busy again within hours. Or you could impress the punters by sending out text updates on how you are solving their problems.

The price is a little more limited, with message costs ranging from 4p to 7p (excluding VAT), depending on how many you buy at once. Our version comes with credits for 30 free texts, so there is plenty of opportunity to try out the program before you spend anything.

UPGRADE OFFER BULK-BUY MESSAGE CREDITS

Once your 30 bundled message credits have been used up, it is time to decide if you would like to buy more. Start small with 50 credits (£3.50 plus VAT, 7p each), buy in bulk (50,000 credits costs only £2,000 plus VAT, 4p each) or pick a quantity somewhere in the middle – it's your call. Click on Actions > Buy Message Credits Online to review the latest prices, then place your order.

FULL VERSION

ON OUR COVER DVD

Roxio Recordnow Deluxe LE

Copy CDs, create audio discs or back up your key data files

INFORMATION

System requirements 128MB of Ram, Windows 98SE or later, CD or DVD writer, 30MB of free disk space

Contact www.roxio.co.uk

Registration Fill in the registration form at www.roxio.co.uk/keys and your details will arrive by email

Some CD mastering programs drown you in complicated options and unnecessary steps – but not this one. Roxio Recordnow Deluxe LE has no pointless frills to slow you down or get in the way, but simply lets you get the job done as quickly and easily as possible.

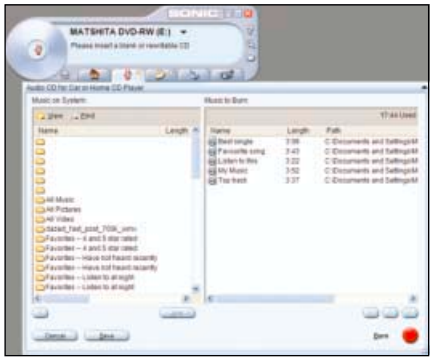
How easily? Try this. Launch the program, click on the Audio CD link to build a music CD, then either locate the music files you need in the file window or drag and drop them in from Explorer (wav, wma or mp3 formats are supported). Optionally drag and drop your chosen titles if you would like to re-order them, place a blank CD in the drive, click on Burn and that is it – as simple as that.

It is much the same with the Data Disc project. After manually choosing the files and folders you would like to add to the CD (or dragging and dropping your selections from Explorer), click on Burn and Recordnow will record them.

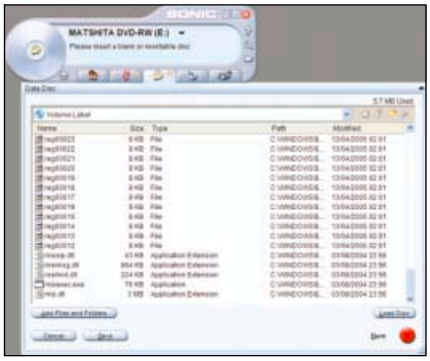
The third and final project in this version of Recordnow will copy CDs for you. It is called Exact Copy and you will find a link to it under the Recordnow Home page.

All this simplicity does not mean the program is short of extras, though. Click on Find > Scan For Music, for instance, and it will build a database of all the compatible music files on your hard drive. You can then view them in many different ways – by artist, album, genre, playlist (asx, m3u and wpl formats are supported) – making it much easier to decide what to add to a particular CD.

Three ways Recordnow Deluxe LE can speed up CD creation



1 Creating an audio CD for the car does not have to be complicated. Click on Find > Browse the first time you use Recordnow and it will locate all the music files on your hard drive. Then select the ones you would like to include on the disc, click on Add, re-order them if necessary and click on Burn to produce the finished disc.



2 Maybe you are more interested in backing up files to CD. Click on Data Disc > Add Files and Folders, choose the files and folders you would like to archive and click on Add. Enter a volume label by typing in the box at the top of the screen, if you like, then click on Burn again. You will have the completed CD in a few minutes.

3 CDs don't last forever, so it pays to back up your most important discs occasionally. To try this with Recordnow, click on the Homepage tab, select Exact Copy and place the CD you are copying in the drive. Click on Copy, wait while Recordnow copies the disc to a temporary file, then replace it with a blank disc when prompted.

UPGRADE OFFER

ROXIO RECORDNOW DELUXE STANDARD

NEW FEATURES

Create MP3 audio CDs
Convert audio CDs to mp3s
Built-in backup
Burn to DVD

The Standard edition of Recordnow Deluxe adds the ability to create mp3 CDs or convert audio CDs to mp3s, along with a complete backup program with DVD support. The regular price is £19.99 but you can upgrade for only £17.99.

You can also get the same 10 per cent off is available across the Roxio range, including Backup MyPC Deluxe, Photosuite Platinum, Videowave Pro and MyDVD Studio Deluxe. Get your discount at www.roxio.co.uk/adban/cd-upgrade/upgrade_en.jhtml or enter the promotional code 'magazines' at the Roxio store.

Xara3D 6

The quickest, easiest and most fun 3D software you'll ever use!

Xara3D 6 is so easy to use you'll be producing slick 3D graphics, text, animations and screensavers in seconds. But don't be fooled - this is a fast and powerful 3D tool that leaves the others standing in terms of speed and quality.

Simply type and drag the on-screen controls to create cool 3D images such as titles and headings, buttons, logos and spectacular 3D animations - ideal for websites, presentations, newsletters and mailshots. With just a few clicks of the mouse, you can even create eye-catching 3D animated screensavers to promote your business.

Get the Free Trial Now!

www.xara.com

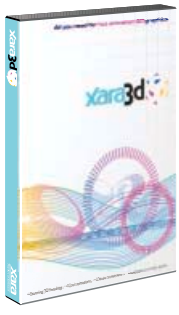
(£28.20 inc VAT)

"Xara3D is very close to divine perfection."
Graphics.com

"Never has a 3D logo animator been so effective, so easy to use or so inexpensive to buy."
Personal Computer World

"Xara3D doesn't include millions of things that you'll never use; instead, it concentrates on the features you actually need. As a result, the program is tiny, goes like lightning and can produce impressive 3D images in seconds."
.net magazine

"We'll be expecting to see lots of high-quality 3D logos out there thanks to this versatile little program!"
Web Pages Made Easy



System Requirements
Microsoft Windows 98/Me/2000 SP2+/XP, 64Mb RAM,
50Mb available hard disk space.

Xara3D

© 2005 Xara Group Ltd. Xara is a trademark of Xara Ltd, all other trademarks acknowledged.

Personal Computer World

Reader Offers

This month's special exclusive deals for PCW readers...

BELKIN WIRELESS MIMO NETWORKING KIT

Bring your network up to speed with the Belkin wireless Pre-N Mimo router. This special offer for readers of *PCW* will rid your network of poor coverage, signal degradation and slow transfer speeds. Mimo stands for Multiple Input, Multiple Output, which means greater range, increased data transmission speeds and increased signal strength over larger distances.

Belkin's wireless Pre-N router has won many awards and accolades since the UK launch in September 2004. In *PCW*'s review we said: 'It's easy to set up and provides a wireless network that's not only extremely fast, but has great coverage as well,' (March 2005, p135).

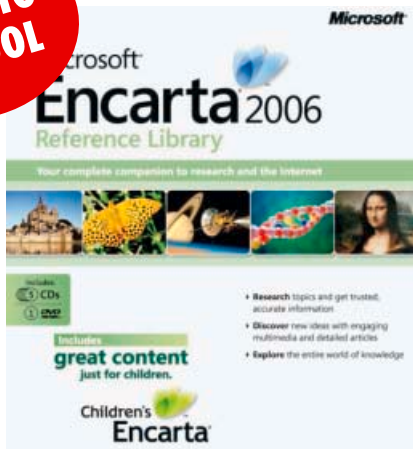
For only £99.99, you will get both the Pre-N Router and either a desktop network card or notebook network card.

Please quote order code Z211 (desktop); Z212 (notebook)

ROUTER/CARD RRP	**£159.98**
SPECIAL READER PRICE	**£99.99**

MICROSOFT ENCARTA PREMIUM 2006

BACK TO SCHOOL



Microsoft Encarta Premium 2006 helps you explore a world of knowledge that's accurate and engaging. The latest version of Encarta Premium 2006 offers enhanced multimedia features, over 68,000 articles, more than 25,000 photos and illustrations, hundreds of videos and animations plus over 2,500 sound and music clips. It also has an interactive atlas with 1.8 million map locations and much more, including new faster, easier interface; Encarta Search Bar; videos from the Discovery Channel; Encarta Kids; and continuous updates. With all these features, learning has never been easier. It's ideal for the whole family – from children with school projects to anyone who just wants to learn more.

Please quote order code Z251

RRP	**£39.99**
SPECIAL READER PRICE	**£38.99**

For a wider selection of discounted products, visit: www.direct-pcw.co.uk

BRIAN LARA CRICKET 2005

SAVE £10

This is a game any cricket fan will truly enjoy – take advantage of this fantastic offer and enjoy hours of quality entertainment. Brian Lara is the best-selling computer game on all formats. Delivering the definitive cricket game experience, Brian Lara International Cricket is now available on your PC. Play and win the Ashes again and again!

Please quote order code Z252

RRP £29.99

SPECIAL READER PRICE £19.99

PCW CD-ROM 5

The latest *Personal Computer World* back issue CD-Rom is now available.

CD-Rom 5 features the entire editorial content from Volume 27 of *PCW*, so you can enjoy all 2004's issues in a searchable, browsable and printable format.

Order this CD today and save space, time and effort.

Please quote order code Z179

Reader price £14.95

SPECIAL SUBSCRIBER PRICE £13.45

HOW TO ORDER

ONLINE
via our secure website
www.direct-pcw.co.uk

PHONE
0870 830 4973

FAX
01858 468 969

POST
Complete this form and send it to:
PCW Direct, Tower Publishing Services Ltd, Tower House, Sovereign Park, Market Harborough, LEICS, LE16 9EF

Your details:

Title Initials Surname Subscriber number (if known)

Address

Postcode Email

Daytime telephone Mobile Fax

Item name:	Order code:	Price £	Qty	Total £
Item name:	Order code:	Price £	Qty	Total £
Item name:	Order code:	Price £	Qty	Total £
Item name:	Order code:	Price £	Qty	Total £

Add £1.99 for postage and packing within the UK, and £6 for ROW — Postage £

TOTAL

We will use the contact details supplied to communicate with you regarding your order. If you are happy for us to contact you about products and services available from PCW and the VNU Business Publications Ltd Group, please indicate here:
Contact by ☐ Email ☐ Mobile.

If you are happy for us to pass your details on to other carefully selected companies to contact you about their products and services, please indicate here:
Contact by ☐ Email ☐ Mobile.

If you do NOT wish us to contact you by POST/TELEPHONE about products and services available from PCW and VNU Business Publications Ltd Group please indicate here ☐.
If you do NOT wish us to pass your details on to other carefully selected companies to contact you by POST/TELEPHONE about their products and services please indicate here ☐.

Methods of payment

☐ I enclose a cheque for the amount of £_____ made payable to VNU Business Publications Ltd

☐ Please charge £_____ to my Credit/Debit card Visa ☐ Mastercard ☐ Amex ☐ Switch ☐ Delta ☐

Card no ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Valid from ☐☐/☐☐ Expiry date ☐☐/☐☐ Issue no (Switch only) ☐☐

Cardholder's signature_____ Date _____

PCW CD-ROM 5 is now available for just £13.45*

12 months of PCW hands-on, reviews columns and advise on one disc

Over 1,500 fully searchable and printable pages

Immediate access to content

Save space

Fast searching

Find that article with ease!

Buying a printer, software or graphics card - search our group tests quickly.

Fully printable so you can take features and reviews with you anywhere !

All this for only £13.45 (Subscriber price) £14.95 (non-subscriber)

A year's worth of Personal Computer World for just £13.45 (*Subscriber price) £14.95 (non-subscriber)

4 EASY WAYS TO ORDER

Telephone your order
0870 830 4973

www.direct-pcw.co.uk

Fax this form to **01858 468 969**

POST THIS FORM TO:
PCW DIRECT, Tower House, Sovereign Park, Market Harborough, Leicester, LE16 9EF

❑ Yes please, I am a subscriber and would like to buy a copy of PCW CD-ROM5 at the special price of £13.45

❑ Yes please, I would like to buy a copy of PCW CD-ROM5 at £14.95

Your Details

Title Initials Surname

Email

Address

Postcode Subscriber number (if known)

Telephone

Payment Options (Please indicate your preferred method of payment)

1. ❑ Cheque enclosed for £_____ (made payable to VNU Business Publications Ltd)

2. ❑ Please charge £_____ to my

Visa☐ MasterCard☐ Amex☐ Delta☐ Switch/Maestro☐ (Issue No. __)

Card No. ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Valid from ☐☐ / ☐☐ Expiry Date ☐☐ / ☐☐

Signature_____Today's Date _____

We will use one or more of the various contact details supplied to contact you about your order, reader research and related products or events. Please indicate below your privacy wishes for other contact from VNU and 3rd party organisations: Email ☐ Tick box to receive information about other products or services from the VNU group of companies by email ☐ Tick box to receive information about products or services from selected companies by email Mobile/SMS ☐ Tick box to receive information about other products and services from the VNU group of companies by SMS ☐ Tick box to receive information about products and services from selected companies by SMS Postal/telephone ☐ Tick box if you do NOT want to receive information about other products and services from the VNU group of companies by post/telephone ☐ Tick box if you do NOT want to receive information about products and services from selected companies by post/telephone.

Computer Evolution:

The original of the species
Over 2 million users can't be wrong!

Personal Computer World

Reader offer!

Gain an international computer qualification

The complete encyclopedia of computer based training includes over 30 courses on 10 CD ROMS

Save up to £130 (~~£199~~ RRP)

The EVOLVE series is a new step by step computer training system including everything you will ever need to know about computers. Also included is the award winning European Computer Driving Licence.

Included on 10 CD ROMS are:

Getting Started With Computers, ECDL/ECDL Advanced, Microsoft Windows Operating Systems, Microsoft Outlook XP/2003, Access XP/2003, Frontpage XP/2003, Word XP/2003, Excel XP/2003, PowerPoint XP/2003 Windows XP/2003, Internet Functionality, PC Maintenance, PC Virus, Windows Installation, Office Integration, Microsoft Project. & Configuration and Windows Security.

Best selling computer training package as seen on TV

Fully Interactive Multimedia

Only £69

* Subscriber price; £72 reader price

FOUR EASY WAYS TO ORDER...

By phone on **0870 830 4973**
Quote code VX58

Online at
http://www.direct-pcw.co.uk

By fax on **01858 468969**
Quote code VX58

By post to:
Personal Computer World, Tower House, Sovereign Park, Market Harborough, Leicestershire, LE16 9EF

Your details

Title Initials Surname

Email

Address

Postcode

Telephone

Mobile

Subscriber number (if known)

Payment options (Please indicate your preferred method of payment)

1. ❑ Cheque enclosed for £_____ (made payable to VNU Business Publications Ltd)
2. ❑ Please charge £_____ to my

Visa☐ MasterCard☐ Amex☐ Delta☐ Switch☐ (Issue No. ___)

Card No. ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Valid from ☐☐ / ☐☐ Expiry Date ☐☐ / ☐☐

Signature_____Today's Date _____

☐ Tick box to receive information about products and services from the VNU Group by email . ☐Tick box to receive work related information about products and services from selected companies by email. ☐ Tick box to receive information about products and services from the VNU Group by SMS. ☐ Tick box to receive work related information about products and services from selected companies by SMS. ☐ Tick box if you do not want to receive information about products and services from the VNU Group by post/telephone. ☐Tick box if you do not want to receive information about products and services from selected companies by post/telephone.

COMPETITIONS

WIN! Three Silver Nikon Coolpix S1 cameras

We reviewed Nikon's stylish, compact Coolpix S1 digital camera in our August issue, where it won an Editor's Choice award for its great design and image quality. We were astounded at the amount of detail it picked up in everyday shots, and how closely it allowed you to photograph objects in macro mode. Now's your chance to win one of three cameras.

Like all the other cameras in the successful Coolpix range, the S1 offers a selection of handy scene modes that make it easy to get good results in everyday situations. Just select from one of the 17 modes and leave the camera to do the rest. Framing your shots is a breeze – the Coolpix S1 has a large, bright 2.5in LCD monitor, which makes it easy to compose and preview shots.

The graphical user interface allows you to select functions by either name or icon, and a handy help button displays explanations for functions on the main menu.

The Coolpix S1 also contains a range of unique Nikon features that enable the user to get better results when shooting in difficult conditions. Nikon's exclusive D-Lighting function automatically adjusts pictures taken with excessive backlight or insufficient flash. D-Lighting adds light and detail to darker parts of images, while leaving areas with the correct exposure exactly as they are. Nikon's in-camera Red-Eye Fix function automatically detects the red-eye effect and then digitally corrects it.

For more information on Nikon's range of products, telephone 0800 230 220, or visit www.nikon.co.uk. For your chance to win a Coolpix S1, answer the question below and follow the instructions on how to enter.

What size is the Coolpix S1's LCD monitor?

a) 1.5in
b) 2.2in
c) 2.5in

How to enter

For your chance to win the prizes from Nikon (page 192), call **0906 616 6317** and for the Panasonic prizes (page 193) call **0906 616 6315** and follow the instructions.

Calls cost 60p per minute from a BT landline (mobile and other network rates may vary) and last approximately 90 seconds. Competition closes midnight on 21 October 2005.

You can also enter online at **www.pcw.co.uk/Competition.**

Rules of entry

These competitions are open to readers of *PCW*, except for employees (and their families) of VNU Business Publications, Nikon and Panasonic. *PCW* is the sole judge of the competition and the Editor's choice is final. Offer applies to residents of the UK and the Irish Republic only. Entrants must be over the age of 18 and only one entry per household will be accepted. Winners will be

WIN! Ten Panasonic BL-C10 network cameras

If you're a budding surveillance expert, or simply want to keep an eye on your property while you're away from home, you'd be wise to invest in a network camera. Better yet, you could try your luck and win a Panasonic BL-C10.

Unlike standard webcams, the Panasonic BL-C10 connects directly to a router and runs its own web server to let you view footage over the Internet. You don't even need to leave it connected to a PC. The camera can be viewed and controlled via the web browser of any compatible device (even some mobile phones), so you'll always have access to your live footage. All you need is a broadband Internet connection.

The Panasonic BL-C10 features a built-in sensor that detects infra-red rays emitted from a heat source such as a human, and can automatically begin recording when it detects motion. The camera can send an email with images attached, thus keeping you aware of any new developments at the scene. The night mode boosts the brightness level in low-light conditions, so you won't miss any detail if it gets dark.

Unlike some network cameras, the Panasonic BL-C10 can be controlled remotely. It can pan +/-50°, and tilt +/-40°, so you can freely position the camera and still get a good view of most objects in the room.

The BL-C10 can be used privately or as a public access camera, so you can provide 24-hour video access to all your friends and relatives. It also has a privacy button, so you can instantly stop it transmitting images over the web. For more information on this and other Panasonic products, visit www.panasonic.co.uk/CCTV, or for your chance to win a Panasonic BL-C10 of your own, answer the question below right and follow the instructions on how to enter.

How far can the BL-C10 pan?

a) +/-20°
b) +/-40°
c) +/-50°

selected at random from all correct entries received. No cash alternative is available in lieu of prizes. VNU will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. VNU reserves the right to substitute the prize for one of greater or equal value if circumstances make this unavoidable. Prizes will be dispatched by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. VNU will use all reasonable efforts to ensure that the prizes are as described on this page. However, VNU cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

September winners: The first-prize winner of the Gigabyte upgrade bundle is Brian Thompson, the first runner-up is Paul Preston, second runner-up Tim Jones, and third runner up Mrs A Ramson. The two first-prize winners of Terratec bundles are Mike Grundy and Anthony Hornby, and the two runners-up are Jennifer Penn and Ian Unwin.

On the web

www.pcw.co.uk

PCW is not just a great monthly magazine, we also have a website carrying news, reviews, features, analysis, downloads, competitions and blogs written by us and our sister VNU titles. The website is updated daily, to help keep you abreast of the latest, most important events and new products hitting the market.

The Test Bed

Rapidly developing a cult following, the Test Bed is our labs blog, written by the team who test and review products. It gives you regular updates on the latest gossip, technology trends and products. We also have a performance area, where product test results can be compared so you can see how well rival products fare against each other – no other PC magazine in the UK offers such an interactive service. Our database of products is growing daily, making it the most comprehensive tool you will find and the perfect complement to our new Buyer's Guides and reviews.

→ **http://labs.pcw.co.uk** → **http://www.reportlabs.com/testbed**

PCW Interactive

You may recognise some entries in this blog from our Letters pages, but they're published here first, letting you add your views. The Customer Services section is also very popular. Here you can comment on how manufacturers have performed and if you would recommend them.

→ **http://vnuuk.typepad.com/pcw_interactive**

PCW Newsletter

If you want to keep up with the latest news, reviews and software downloads, plus see what's happening in our blogs, then sign up for our free newsletter, sent out every Friday. It's a quick, easy and convenient way of reading the latest from the industry without scouring the Internet.

→ **https://www.vnuservices.co.uk/pcw**

PCW tests and reviews

Our tests and reviews are independent, with no outside influence from manufacturers. Vendors are not allowed to see the results of our tests before publication, ensuring you can completely trust the independence of what you read.

Prices: All prices include VAT unless otherwise stated.

EDITORIAL
Tel 020 7316 9000 **Fax** 020 7316 9313 **www.pcw.co.uk**
Editor Rob Jones
Deputy Editor Kelvyn Taylor
Associate Editor (News) Clive Akass
Reviews Editor Will Stapley
Staff Writer Rory Reid
Labs Project Managers Alex Arias, Simon Crisp
Group Editorial Assistant Anna Lagerkvist

Editorial Contributors Tim Anderson, Anthony Dhanendran, Sascha Faber, Barry Fox, Jorg Geiger, Cliff Joseph, Guy Kewney, Gordon Laing, Martin Lynch, Niall Magennis, Dave Mitchell, Ken McMahon, Paul Monckton, Tim Nott, Luke Peters, Terry Relph-Knight, Barry Shilliday, Alan Stevens, Stephen Wells, Mark Whitehorn, Nigel Whitfield, Chloe Woodman

ART & PRODUCTION
Art Editor Jonathan Ross
Production Editor Debbie Oliver
Deputy Production Editor Kathryn Twyford
Sub Editor Maddy Kent

Art & Production Contributors Hazel Bennington, Dean Gurden, Bruce Mackie, Donatella Montrone, Susie Norris, Salvatore Spagnuolo, Simon Turner

PUBLISHING
Publisher Richard Wilson
Publishing Director Anita van der Aa
Managing Director & Chief Executive Ruud Bakker
Finance Director Paul Skelly
Founder Angelo Zgorelec

MARKETING & CIRCULATION
Group Marketing Manager Timothy Webb
Marketing Executive Kieran Proverbs
Subscriptions Manager Harriet Cumming
Newsstand Manager Emma Smyth
New Media Manager (CD/DVD) Chris Wiles

ADVERTISING
Advertisement Sales Hotline 020 7316 9465
Sales Manager Jonathan Busse 020 7316 9773
Major Client Manager Paul Harvey 020 7316 9465
Client Manager Mark Rankine 020 7316 9305
Sales Executive Shila Shah 020 7316 9144

US Sales Representation Global Media USA LLC, 565 Commercial Street, 4th floor, San Francisco, CA 94111-3031, USA Tel: 001 415 249 1620 www.vnuglobalmedia.com

European/Asian/Middle East Representation Global Media Europe Ltd, 32-34 Broadwick Street, London, W1A 2HG. Tel 020 7316 9638 www.globalreps.com

Taiwan Sales Representatives Transactionmedia Ltd, 7th floor, Suite 7, 2 Fu Hsing North Road, Taipei, Taiwan 00 886 2 8772 5145. Contacts: Nitin Joshi, Lilly Mao

CENTRAL PRODUCTION
Production Director Joanne Hurst 020 7316 9227
Production Manager Cathy Mahoney 020 7316 9486
Production Controller Luke Humphreys 020 7316 9584

To email any PCW staff member use the following: **forename_surname@vnu.co.uk**, substituting the person's name as it appears on this page

vnu labs VNU's European Labs fulfil the testing needs of VNU's portfolio of magazines. The labs in London, Amsterdam, Milan, Brussels, Paris, Munich and Madrid provide testing for all VNU's European titles.

Printed and bound by St Ives (Roche) Ltd
Distributed by Marketforce (UK) Ltd, 5th Floor, Low Rise Building, King's Reach Tower, Stamford Street, London SE1 9LS

ABC 93,086 Jan-June 2005

vnu business publications

CUSTOMER SERVICES
Enquiries or complaints regarding any advertiser in this magazine should be emailed to lisa_cook@vnu.co.uk, or sent to: Lisa Cook at 32 Broadwick Street, London, W1A 2HG. Tel: 020 7316 9404

The opinions expressed and results published in connection with reviews and laboratory test reports carried out on computing systems and/or other related items are confined to, and are representative of, only those goods as supplied and should not be construed as a recommendation to purchase.

PCW cannot give technical help/support services, either written or verbal.

REPRINTS & EXTRACTS
We offer a full reprint service for reproduction of all or part of previous articles. For orders, call Natalie Lue on 020 7316 9208. We are happy for people to use quotations and segments for internal or promotional purposes. No material may be reproduced in whole or in part without written consent from the copyright holder. © VNU Business Publications 2005

LICENSING
Personal Computer World is available for international licensing. Please contact Joanna Mitchell at joanna_mitchell@vnu.co.uk for more information.

FOR BACK ISSUE AND COVER DISC ORDERS
Tel 0870 830 4973 **Fax** 01858 468 969
Personal Computer World, Tower House, Sovereign Park, Market Harborough, Leicestershire LE16 9EF

Back issues/cover discs UK prices (inc P&P)
Back issue (CD version) £5 (£8 Europe*, £10 ROW)
Back issue (DVD version) £7 (£9 Europe*, £11 ROW)
Back issue prices for current subscribers: CD version £3.75 (£6 Europe*, £8 ROW); DVD version £5.49 (£7 Europe, £9 ROW)
* Europe includes the Republic of Ireland

For faulty or damaged CDs please ring 08700 885 995 between 9.30am and 5pm weekdays, except Wednesday when lines are open until 8pm, and between 10am and 2pm Saturdays. Email: pcw@vnusupport.co.uk, quoting the issue date.

MAIL ORDER PROTECTION SCHEME (MOPS)
When you order goods as a private individual reader from a UK supplier's advertisement in PCW and pay by post in advance of delivery to that Mail Order Advertiser, which subsequently ceases to trade and goes into Liquidation or Bankruptcy prior to delivery of such goods, you may, under the MOPS scheme, qualify for compensation, providing:
1. You have not received the goods or had your money returned.
2. The goods ordered were as depicted/described in a display advertisement.
3. You have taken all reasonable steps to effect delivery or refund.
4. You have retained irrefutable proof of purchase, for verification purposes:
a) The original advertisement from which the goods were ordered.
b) Comprehensive proof of payment.

GUIDELINES Claims must be submitted so as to arrive 'NOT EARLIER THAN TWENTY-EIGHT DAYS AND NOT LATER THAN THREE MONTHS' from the official on-sale date of the magazine. Claims must be submitted to Lisa Cook IN WRITING, summarising the situation and lodged strictly within the time schedule stated. Claims received outside this period will not qualify for consideration for compensation under the Mops scheme. Once a supplier who has advertised in this magazine has become subject to either Liquidation or Bankruptcy proceedings and upon completion of all winding-up procedures, PCW guarantees to expeditiously process those private individual readers' claims made and submitted, in accordance with those procedures outlined, up to the following limits.
a) £2,000 in respect of any claim submitted by one Private Individual Reader.
b) £100,000 in respect of all advertisers so affected in any one year.
c) £30,000 in respect of any one advertiser.
These sums define the Publisher's maximum liability under the scheme, and any additional payments above and beyond these thresholds will be entirely at the Publisher's discretion. As soon as legal confirmation that a state of liquidation or bankruptcy exists, the processing of claims will immediately commence. If, however, assets are available and the receiver/liquidator appointed confirms that an eventual payment will be made by way of a dividend, all claims under the Mops scheme will be subject to reprocessing and will take into account any shortfall which may then exist. Payments under the scheme will also take into consideration the obligations and liabilities of other interested parties, such as credit card and/or insurance organisations, etc.

EXCEPTIONS This guarantee only applies to advance postal payments made by private individuals in direct response for goods itemised/illustrated in display advertisements. It does not cover goods ordered from advertising Inserts or Cards, classified advertisements or Micromart, or Catalogues obtained from, or supplied by, any advertiser regardless. Similarly, protection does not exist in relation to purchases made as a result of reviews and/or editorial comment. The Mops scheme is designed to safeguard the PRIVATE individual reader. It does not provide protection to any companies, societies, organisations, unincorporated bodies or any other commercially orientated outlet of any description. Neither is cover provided for orders placed from, or to, any overseas suppliers or for goods purchased for resale.

CAVEAT EMPTOR Readers are reminded that the Mail Order Protection Scheme was solely implemented to provide protection to the private individual when goods are ordered 'Off the Page' and paid for by post. It was not designed for, nor will it offer any protection, in the event whereby goods are purchased via the Internet.

CREDIT CARD PROTECTION Always pay by credit card when ordering goods valued in excess of £100, thereby ensuring maximum protection in the event that an advertiser ceases to trade prior to such goods actually being received.

DISCLAIMERS Readers are reminded that the opinions expressed, and the results published in connection with reviews and/or laboratory test reports carried out on computing systems and/or related items, are confined to, and are representative of, only those goods as supplied and should not be construed as a recommendation to purchase. Whilst every precaution is taken to ensure that reliability and good business practices prevail, the Publisher cannot be held responsible for the overall trading activities of any supplier referred to, or advertising within, this publication.

SUBSCRIPTION ENQUIRIES

Benefits of subscribing

- Save money on the cover price
- Special subscriber discounts on all PCW Reader Offer products
  www.offersdirect.pcw.co.uk
- Receive your issue before the on-sale date
- Money-back guarantee – if you're not 100% satisfied with your subscription, we will refund the cost of any unmailed issues – no questions asked

Contact us for information about existing or new subscriptions

Online via our secure website:
www.subscription.co.uk/help/vnu
Email **vnu@subscription.co.uk**
Tel 01858 438 881
(Weekdays 8am – 9.30pm;
Saturdays 8am – 4pm)
Fax 01858 468 969
Post Personal Computer World, Tower House, Sovereign Park, Market Harborough, Leicestershire LE16 9EF

Manage your subscription online

Just visit **www.subscription.co.uk/help/vnu** for instant access to your subscription account. Use the above email address to check your current subscription – see how many issues you have left, or find out our publication dates.

Personal Computer World, VNU House, 32-34 Broadwick Street, London W1A 2HG
Main switchboard 020 7316 9000
Lisa Cook, Client Services Executive
020 7316 9404

READERS AND SUBSCRIBERS

Register your email address with us to receive information about PCW special offers. Just visit:
www.subscription.co.uk/vnu/email

Personal Computer World

NEXT MONTH

ON SALE 20 OCTOBER 2005

Ultraportable laptops

Fed up with lugging your 4kg monster notebook home every day? Why not make a lifestyle change and swap it for a 2kg miniature version – they may be small, but they can certainly punch above their weight when it comes to processing power.

Find out which tiny laptop suits you

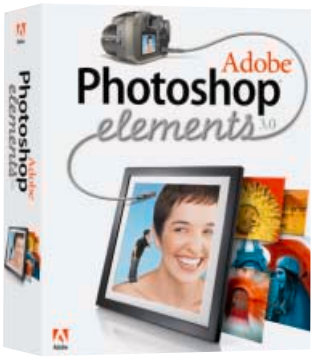
Inkjet ink

In the second part of our in-depth investigation into the world of inkjet photo printing, we find out whether buying cheap ink cartridges is a false economy, or whether it's something we should all be doing.

Does inkjet ink need to be expensive?

Digital photo editing

'Daddy, what's photographic film?' is a question that will soon be commonplace as the digital photo revolution enters its final phase. Photo-editing software is something that anyone with a digicam needs, but not everyone can afford Photoshop, so we've tested up some of the best low-cost packages around.



Low-cost photo editing on trial

High-definition TV

As TV screens get bigger, the awful quality of standard TV broadcasts and DVD content becomes glaringly obvious. High-definition TV (HDTV) promises to rectify this, but at the moment it's a minefield of jargon and conflicting standards. Follow our guide to get you through the HDTV jungle.

There's lots more in December's PCW
DON'T MISS IT...

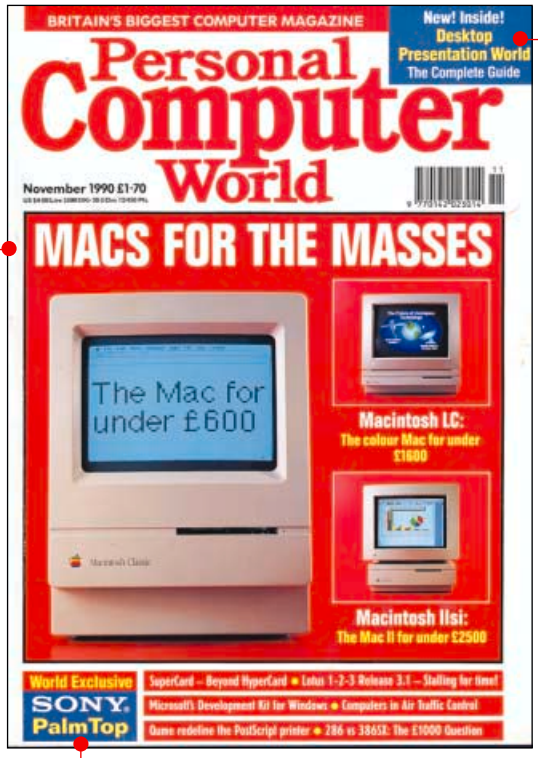
NOVEMBER 1990

From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

We finally succumbed to pressure from Mac lovers and dedicated the cover and benchtest to reviewing the latest additions to the Apple Macintosh range. The test focused on the release of three new Macs; The Classic, the LC and the IIsi.

These were aimed at the lower end of the market, answering criticism that the company's marketing strategy was elitist and that Apple didn't produce any entry-level machines. These three offerings started at a reasonable £595 compared to the old minimum of £995.

This was a good start, although we soon discovered that some design aspects had been sacrificed to meet target prices and this affected the performance of the machines.



Presentation packages were much more numerous than they are now – of the six we looked at in 1990, only Harvard Graphics and Microsoft Powerpoint are still around in 2005. Our guide reckoned Powerpoint was the best – and one of the reasons that made Bill Gates the '33rd richest man in the world'.

We also took a look at the pioneering Sony Palmtop PTC-500 and wondered about the future of computing in the palm of your hand. Although promising, the Palmtop wasn't really a credible option at the time, as it was only available in Japanese.

NOVEMBER 1980

PCW and key industry figures realised that our future survival as a nation depended on widespread computer literacy. Our November 1980 cover focused on this theme, displaying an image of a family representing the community and our feature was described as 'probably the most significant article ever published in *PCW*'. This sounded dramatic, but the advance of technology was inevitable and so the article discussed ways to introduce the public to some computer basics.

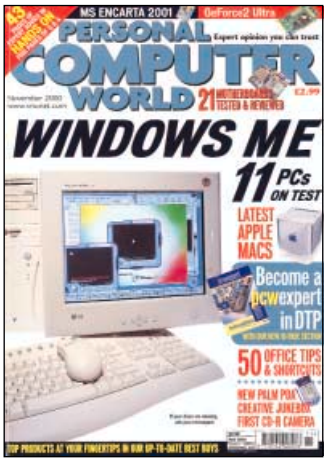
We benchtested the latest PC from Japan, the SBS-8000, which we hoped would do for computers what Japanese technology had done for TV and hifi. It proved not quite as revolutionary, but it was a well-made machine with a decent Basic language, as well as taking a step towards the multi-user system with its ability to partition memory.

Elsewhere, a round-up of the *PCW* Show offered views from youngsters. But it seems there was some confusion over our name, with a radio presenter dubbing us Personal Computer Show, before finally getting it right.

NOVEMBER 2000

In our November 2000 group test, we challenged 11 manufacturers to put together machines for Microsoft's new Windows Millennium Edition. The PC had to be equipped with 128MB of memory, a 10GB hard drive, speakers and the new Media Player, all for £999. The Atlas Meridian A800T ME came out on top – it wasn't the cheapest, but it was quick, with lots of added extras.

As virtual people on websites were given 'minds', Clive Akass asked if the web was breeding life. UK developer Stratumsoft's Evas (electronic virtual assistants) could be 'raised' to have personalities and abilities.



Elsewhere, Riyad Emeran complained about the pricing structure between the UK and the US becoming more unfair in the new online marketplace. Emeran argued that the Internet world market would make manufacturers rethink their country-specific pricing policy.

Until then, he said, we should all 'stop whinging' and start searching the web for products before going down the high street.

Dedicated Servers

Powered by DELL hardware and Windows Server 2003

great value entry level server

£99 PER MONTH

- DELL PowerEdge SC1425
- Xeon 2.8Ghz 64-bit processor with 1MB L2 cache
- 256MB DDR2 SDRAM 400Mhz Memory
- 80GB SATA Hard Disk
- Windows Server 2003 Web Edition

FREE BANDWIDTH
FREE FIREWALL

Microsoft Windows Server 2003 Web Edition

powerful mid-range server

£149 PER MONTH

- DELL PowerEdge SC1425
- Dual Xeon 2.8Ghz 64-bit processors with 1MB L2 cache
- 1GB DDR2 SDRAM 400Mhz Memory
- 160GB SATA Hard Disk
- Windows Server 2003 Web Edition

FREE BANDWIDTH
FREE FIREWALL

Microsoft Windows Server 2003 Web Edition

mission-critical server

£314 PER MONTH

- DELL PowerEdge 1850
- Dual Xeon 3.0Ghz 64-bit processors with 1MB L2 cache
- 2GB DDR2 SDRAM 400Mhz Memory
- Dual 73GB SCSI Hard Disks RAID Level 1
- Windows Server 2003 Web Edition

FREE BANDWIDTH
FREE FIREWALL

Microsoft Windows Server 2003 Web Edition

build your own server

from £99 PER MONTH

Build your custom Dell server at redstation.com and get an **instant online quote** from just £99.

PCW11

Dedicated servers designed for reliability and flexibility.

Redstation's range of Dell dedicated servers are **completely scalable** as your business needs grow, with an option to fit **every need** and **every budget**. Dedicated servers are great for busy or important websites that require **custom server management** or for hosting resellers and web developers who need greater **flexibility**, **reliability** and **security**.

All dedicated servers include:

- Windows Server 2003 Web Edition
- IIS6 Web, FTP and DNS Server
- Microsoft Mail Server
- Unrestricted Administrator Access
- Install any applications
- Dedicated Internet Connection
- Secure Private Gigabit LAN
- Host Unlimited Websites
- Your own IP range
- Shared Hardware Firewall Protection
- Daily Automatic Security Updates
- Remote Power Reboot Control
- 24/7/365 Telephone Support
- 100% Uptime Guarantee
- The best support in the industry!

Optional upgrades:

- Tape Backup (Daily, Weekly or Monthly)
- Dedicated Hardware Firewall
- 2003 Standard Edition or 2000 Server

Plus get this iPod absolutely free!

Free iPod
with every dedicated server!
When you mention this offer code: PCW11
See www.redstation.com/ipod/ for details.

Call 01329 828224
or visit **www.redstation.com**

redstation®
established 1998